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RELATIVE MEANING AND PRONUNCIATION DIFFICULTIES OF THE THORNDIKE 20,000 WORDS

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THERE has been much discussion of relative difficulty of words in the successive thousands of the Thorndike list. This report gives the results of a study of ability to work out recognition, pronunciation and meaning of a random sampling of 600 words, thirty from each of the twenty thousands.

The subjects were approximately 600 pupils from grades 2B to 6A in New York City schools. The following test results were obtained from each child.

1. Mental Age: a recent group test given by the school or by a special, trained examiner.
2. Reading Grade: one or more forms of the Gates Primary or Grades 3-8 tests given by the examiner.
3. An isolated word, oral pronunciation test of the 600 words, given individually; details given below.
4. A context word, oral pronunciation test of the 600 words given individually.
5. A multiple choice word-meaning test of each of the 600 words.

The tests were administered by a group of trained examiners employed by the W.P.A. in a series of periods sufficiently short to avoid fatigue or boredom. The examiner began at the easy end of the series and continued the examination to the end, or until the pupil made 40 consecutive errors. All these word tests were given to each child. The same words were used in each test but the tests on a given word came at long intervals. The order of the three tests was rotated.

TABLE I

SHOWING NUMBER OF WORDS CORRECT OUT OF 30 FOR EACH OF THE THOUSAND IN THE THORNDIKE LIST. NUMBER OF PUPILS APPROXIMATELY 597

Thousand	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Pronunciation: Isolated Word	27.0	24.6	20.5	20.1	17.3	17.0	14.7	15.9	13.5	12.4	14.4	12.6	13.8	12.1	9.7	10.9	12.3	11.3	11.2	12.3
Pronunciation: Words in sentences	27.1	25.4	20.7	20.0	17.0	16.8	14.9	15.6	13.0	12.2	13.4	12.0	13.9	11.6	9.1	10.5	12.1	10.9	10.8	11.3
Meaning: Multiple choice	26.4	26.6	14.5	13.2	10.1	7.7	7.7	6.8	6.0	4.4	4.6	2.0	3.9	2.0	1.1	1.2	1.4	1.2	1.4	1.1

The pronunciation of isolated word test and the context tests were scored by giving a credit of one for each key word correct.

The multiple choice test consisted of the key word and four possible choices. The choices consisted of words from the same or lower thousands on the list in the case of words from the third thousand to the twentieth, and of four picture choices for words in the first two thousand. Examples are:

1. apple (pictures of—tree cherry triangle apple
60. wooden (pictures of—clothes pin hat flower glass
120. youthful useful old young pretty

The subject underlined the chosen word or picture until he had completed the list or until he was obviously beyond his depth. Score was rights minus one third wrong.

Table I shows the results for all pupils combined. The entries are the number of words correct out of 30 for each thousand, first to twentieth, of the Thorndike list.

TABLE II

PRONUNCIATION OF ISOLATED WORDS

SHOWING THE NUMBER OF WORDS CORRECT OUT OF 30 FOR EACH THOUSAND IN THE THORNDIKE LIST IN THE CASE OF PUPILS AT VARIOUS READING GRADE LEVELS

		Thousand																			
R.G.	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2.00–2.49	17	18	14	7	8	6	5	5	5	4	3	4	3	3	3	2	2	3	3	3	4
2.50–2.99	39	21	15	7	8	4	5	4	5	4	3	4	3	3	2	2	2	2	2	2	2
3.00–3.49	65	25	20	10	10	7	7	6	7	5	4	4	4	4	3	2	2	3	3	3	3
3.50–3.99	49	29	26	18	17	13	13	11	12	9	7	9	8	9	8	5	6	7	6	6	8
4.00–4.49	25	29	27	20	19	15	15	11	12	9	7	9	7	8	7	4	5	8	6	6	7
4.50–4.99	31	30	29	24	23	18	18	15	16	14	12	14	12	13	12	8	9	12	11	10	12
5.00–5.49	30	30	28	24	24	20	20	15	17	14	12	14	12	14	12	9	10	13	11	12	13
5.50–5.99	32	30	28	26	26	20	21	16	18	15	13	15	13	14	12	10	10	13	11	11	12
6.00–6.49	25	30	30	27	26	22	20	17	19	16	14	17	15	17	15	10	12	15	14	13	15
6.50–6.99	23	30	30	27	27	22	22	18	20	17	16	18	16	18	16	11	14	16	14	14	15
7.00–7.49	36	30	30	27	27	24	23	19	21	18	17	20	17	20	16	13	14	17	15	15	16
7.50–7.99	20	30	30	28	28	24	23	21	22	18	17	20	17	19	17	14	14	17	16	15	17
8.00–8.49	24	30	30	29	28	25	24	21	22	20	18	21	18	20	17	15	17	18	17	16	18
8.50–8.99	15	30	30	30	29	28	27	24	26	23	23	25	24	25	23	20	22	23	22	21	22
9.00–high	24	30	30	29	29	27	27	24	25	23	22	25	22	24	21	18	21	21	20	21	22

TABLE III

PRONUNCIATION OF WORDS IN SENTENCES

SHOWING THE MEAN NUMBER OF WORDS CORRECT OUT OF 30 FOR EACH THOUSAND IN THE THORNDIKE LIST IN THE CASE OF PUPILS AT VARIOUS READING GRADE LEVELS

		Thousand																			
R.G.	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2.00–2.49	17	19	15	8	7	4	5	4	5	3	2	4	2	3	2	2	2	2	2	2	3
2.50–2.99	39	23	16	7	7	4	4	4	4	3	2	3	2	2	2	1	1	2	2	2	2
3.00–3.49	65	26	23	11	10	7	7	7	7	4	3	4	3	4	2	1	2	3	2	2	3
3.50–3.99	49	29	27	18	18	12	13	12	12	9	7	8	7	8	7	4	5	6	5	5	6
4.00–4.49	25	30	29	21	20	16	16	11	12	9	7	8	7	8	8	4	5	7	6	6	6
4.50–4.99	31	30	29	24	24	19	18	16	16	13	12	13	11	13	11	7	7	11	9	9	10
5.00–5.49	30	30	30	25	25	20	18	15	17	13	12	13	12	14	12	8	10	13	11	11	11
5.50–5.99	32	30	30	26	25	20	20	16	18	14	12	15	12	14	12	10	10	13	11	11	12
6.00–6.49	25	30	30	27	26	22	21	18	19	16	14	16	14	17	14	10	12	15	13	13	13
6.50–6.99	23	30	30	28	27	23	23	18	20	17	15	18	15	18	15	12	13	15	15	15	14
7.00–7.49	36	30	30	28	27	24	23	19	21	18	16	18	15	19	15	11	13	16	14	14	14
7.50–7.99	20	30	30	19	27	24	23	20	23	18	17	18	17	20	16	12	14	17	15	14	16
8.00–8.49	24	30	30	19	28	25	24	21	22	20	19	21	19	22	17	14	17	19	17	17	17
8.50–8.99	15	30	30	30	29	27	27	24	26	22	22	23	22	24	22	18	21	22	20	20	22
9.00–high	24	30	30	30	29	27	26	24	25	22	22	24	21	25	21	17	21	21	21	21	21

It will be noted that the scores for the first two thousand words are about the same for all three types of tests and that, beginning with the third thousand, they drop off appreciably until the tenth or eleventh thousand, beyond which they are uniformly low. The scores for word meanings, beginning with the third thousand, drop off much more rapidly than for pronunciation of words in isolation or in context. Of the first two thousand words, the pupils know the meanings of as many words as they can recognize; in the third thousand, they can work out the recognition of about 69 percent but solve the multiple choice meaning exercises of only about 48 percent; by the time the sixth thousand is reached the recognition and pronunciation score is twice as high as the meaning score and on the tenth thousand it becomes three times, and later even greater.

In all cases, the increase in difficulty of the words from the first to the tenth thousand is very clear; there is little difference beyond the tenth. However, it must be noted that the typical pupil fails on some in the earliest thousands and succeeds on others in the highest groups.

Table II shows the relative difficulty of the various thousands for pupils of several Reading Grade levels in the test of pronunciation of isolated words; Table III for pronunciation of words in sentences and Table IV for word meanings in the multiple choice test.

In all thousands in all tests, the scores increase with the Reading Grade. At all Reading Grade levels, moreover, the lower thousands are easier than the higher, but the increase in scores is not uniform for the various Reading Grade levels.

In pronunciation of isolated words and of words in sentences, the first thousand words are slightly better known than the second by pupils with Reading Grades from 2.0 to 4.0, when they become approximately equally and perfectly known. For pupils in this range, there is relatively a sharp drop in words known in the third thousand, followed by a slow decline until the tenth thousand, beyond which very few are recognized. The first two thousand, in other words, are much better known than any subsequent forms. For pupils with Reading Grades above 4.0, the first two thousand are easier but the decline in scores thereafter is more gradual to the tenth thousand. Indeed, the descent from the first two thousand to the tenth becomes regularly less abrupt from the lowest to the highest Reading Grades. Pupils between Reading Grade 2.0 to 2.9 recognize six or seven words in the first thousand for every one in the tenth; between Reading Grade 3.0 to 3.9, five to one; Reading Grade 4.0 to 4.9, three to one; Reading Grade 5.0 to 5.9, two and a half to one; Reading Grade 6.0-6.9, two to one and in the highest Reading Grade groups, 7.0 to 9.0, three to two. It is notable that even for the most advanced pupils—those of junior high school reading attainments on the Gates tests—approximately two out of three words beyond the tenth thousand are not recognized correctly whereas words in the first two thousand are known quite perfectly and those in the third and fourth nearly perfectly.

Knowledge of the meaning of words as shown by results of the multiple choice tests, lags consistently behind word recognition at all reading grade levels.[1] The differences, in fact, become greater the higher

[1] The pupils of lower reading grades do better on the multiple choice meaning test for the first two thousand words than on the word pronunciation tests. Since the multiple choice tests for these words consisted of the word and four pictures, it is probable that the pictures narrowed the range of choice and the pictorial clues thus helped in recognition. This accounts for the noticeably greater drop in scores for the third and later thousands in which the alternatives were words. Both pronunciation tests, however, were identical in form for all thousands.

TABLE IV

Word Meanings—Multiple Choice

Showing the Mean Number of Words Correct out of 30 for Each Thousand in the Thorndike List in the Case of Pupils at Various Reading Grade Levels

		Thousand																			
R.G.	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2.00–2.49	17	19	19	5	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
2.50–2.99	39	21	20	4	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3.00–3.49	65	24	23	4	4	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
3.50–3.99	49	27	28	8	6	3	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0
4.00–4.49	25	27	30	10	9	5	3	4	2	1	1	2	0	1	1	0	0	0	0	0	0
4.50–4.99	31	28	30	14	11	7	4	4	3	2	1	1	0	0	0	0	0	0	0	0	0
5.00–5.49	30	29	30	14	15	9	5	6	4	2	1	2	0	1	0	0	0	0	0	0	0
5.50–5.99	32	29	29	16	15	9	6	8	6	3	2	2	0	1	1	0	0	0	0	0	0
6.00–6.49	25	29	30	17	16	10	8	8	7	4	3	4	2	2	1	1	1	1	1	1	1
6.50–6.99	23	29	30	19	21	14	11	10	10	6	6	6	2	5	2	0	0	0	0	0	0
7.00–7.49	36	29	30	20	18	13	10	10	10	7	6	7	2	6	3	1	1	1	1	1	0
7.50–7.99	20	29	30	21	19	14	11	10	9	7	6	6	3	6	2	0	2	2	1	2	2
8.00–8.49	24	29	30	20	21	16	13	10	10	8	8	8	3	5	1	1	1	1	1	2	1
8.50–8.99	15	29	30	24	22	20	17	16	14	13	11	12	5	11	5	2	2	3	3	4	4
9.00–high	24	29	30	25	25	21	18	16	16	14	14	13	7	12	7	4	4	5	5	6	5

TABLE V

Mean Scores for Boys and Girls Separately

Pronunciation of Isolated Words

	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Boys	235	27	25	20	20	16	16	14	15	12	11	12	11	12	10	8	9	11	10	10	11
Girls	222	28	26	21	21	18	17	14	15	13	12	13	12	13	11	8	9	12	10	10	11

Pronunciation of Words in Sentences

	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Boys	235	28	26	21	20	16	16	14	15	12	10	12	10	12	10	7	8	10	9	9	9
Girls	222	29	27	22	21	18	17	14	15	12	11	12	11	13	11	8	9	11	10	10	10

Meanings—Multiple Choice

	No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Boys	235	27	27	13	12	8	6	6	6	4	3	4	2	3	2	1	1	1	1	1	1
Girls	222	27	28	13	12	8	6	6	5	3	3	3	1	2	1	0	1	1	1	1	0

the Reading Grade. Even for pupils with Reading Grades above 6.0, few multiple choice exercises were solved for words above the tenth

thousand—those above the thirteenth thousand were notably difficult. For these pupils the percentages of the words correct in the multiple choice meanings tests are for the successive thousands approximately: 100, 100, 66, 60, 50, 38, 33, 32, 28, 21, 20, 18, 15, 10, 7, 7, 7, 7, 7, 7.

The data for the pupils were tabulated in Mental Age (M.A. 70-194) and School Grade (2B-6A) categories. The mental age array is very similar to the Reading Grade picture shown in Tables II, III and IV, being slightly less consistent. For this the explanation may be the fact that the reading tests were given under more uniform conditions and nearer the time of the word study tests than were the intelligence tests. The tables based on school grades show the same general facts, but less clearly. This is doubtless due to the fact that the grade groups overlap greatly both in reading ability and mental age. Since it is believed these six large tables for the mental age and school grade distributions would add little of significance, they are not included in this report.

The data were also assembled for the sexes separately without computation of the mean ages, mental ages, grades or reading abilities of the two groups. The results are given in Table V. The patterns are essentially identical and quantitative differences negligible and inconsistent although the grand total score would favor the girls very slightly.

Summary: Approximately 600 pupils from Grades 2B to 6A were tested in (1) working out the recognition and pronunciation of each word in isolation and (2) in context (sentences) and (3) in solving a multiple choice meaning test, in the case of 30 words selected at random of each of the twenty successive thousand words in the Thorndike list. The Reading Grade and Mental Age of each pupil were determined. In general, the first thousand words is slightly easier than the second; and the successive thousands from the second to the tenth show increasing difficulty. Beyond the tenth thousand the increase in difficulty is slight. The lower the pupil's reading grade (or Mental Age or School grade) the more conspicuous is the relative ease of the first and second thousand. Not until the sixth grade is reached do the pupils recognize half as many words in the tenth as in the first two thousand. Scores on the word meaning test are everywhere considerably lower than scores on word recognition. The findings can be effectively used in adjusting the vocabulary of reading materials to the Reading Grade of the pupil.

PATTERNS OF THE DELIBERATIVE[1] METHOD OF RESEARCH IN EDUCATION

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WRITERS in the field of research stress the usefulness of synthesis, evaluation, and interpretation; and emphasize the need for educational thinkers as well as educational fact finders. These writers, however, fail to give to a method incorporating these procedures its merited place among research methods. Apparently they believe that since the deliberative element enters all research to some extent, it is unnecessary to differentiate it as a separate method.

With respect to their attitudes toward the deliberative method, research methodologists may be classified into several groups. First, there are those who make no reference to it whatsoever, ignore it by name at least, and maintain that all investigational activity properly to be described as research must stress the objective viewpoint and employ scientific methods. A second group of writers, although not recognizing it as a distinct method, do refer to its presence and acknowledge that it is an influence or factor permeating all research. They maintain, however, that since its function is to vitalize and enrich the products of all other methods, it deserves no special recognition as a method in itself. Still another group sets down fundamental distinctions between science and philosophy, between objective and subjective methods, implicitly recognizing the functioning of the deliberative element and yet sees no value in formulating a plan for its use by students of education. This group appears to believe that since the deliberative method is an antithesis of scientific methods, it should be made subordinate to procedures manifestly objective. A fourth group would make the deliberative method coördinate with other methods of dealing with educational problems but have not systematically formulated its aims and procedures.

Each classification of method is based upon a definite conception as to what constitutes research. When one collects a large number of theses or reports of attempts to deal with educational problems, and groups

[1] This method is generally referred to as the "philosophical method." Philosophic suggests content and is related historically with systems of thought. Because of the variety of suggestions aroused by this term and because of associations which have created confusion and caused objections, it was thought that the term "deliberative," meaning literally "to weigh" evidence, would be more descriptive of the procedure actually used.

them on the basis of similarity of procedure, the number of well defined methods obtained is limited. Among them appears one which is here called the deliberative method. One also discovers that seldom, if ever, does any study appear which employs one method exclusively. Methods are not discrete but continuous, and yet there is justification in making such distinctions in order to call attention to the peculiar functions of certain procedures. Methods, thus classified, should be regarded as more or less complementary or supplementary.[2] To call deliberation a separate method is not to say that it functions in entire independence of all other methods. Nevertheless, there are studies which employ deliberation predominantly—studies of problems which defy the objective approach.

To call only strictly objective and measurable elements research and to omit abstract elements either admits the weakness or narrowness of research or belies its fundamental integrity. Until, therefore, the importance of deliberation is clearly recognized and generally accepted, it must be expected that the quality of research will suffer through the misuse of this vital factor in the hands of novices in research and even of mature workers. As a safeguard to all research the deliberative method should be elevated to a place of dignity as a research method in its own right and its procedures systematized.

Insistence upon this demand obligates one to determine the need and value of systematically formulating the procedures. Obviously, if the method is found to be used sufficiently or if there are problems requiring its use, its need and value are clearly established. In the former case, a survey of current writing attests the fact that deliberation is extensively used in educational investigations. In the latter case, common sense decrees that there are problems which can be attacked satisfactorily by no other method. Hence, efforts to dignify the method are likely to succeed or fail according to the degree of conscious use or proven value of the method as a means of dealing with problems in education.

It is true that illustrations of the method were more numerous during the early part of this century than at the present time. In explanation,

[2] Durant, Will. *The Story of Philosophy* (New York: Simon and Schuster, 1926), pp. 2-3.

Good, Carter V., Barr, A. S., and Scates, Douglas E. *The Methodology of Educational Research* (New York: D. Appleton-Century Company, 1936), pp. 24, 231-232.

Kilpatrick, W. H. (1) "Philosophy and Research—The Relations of Philosophy and Science in the Study of Education," *School and Society*, XXX (July, 1929), pp. 39-48.

Kilpatrick, W. H. (2) "Relation of Philosophy to Scientific Method," *Journal of Educational Research*, XXIV (September, 1931), pp. 97-114.

therefore, it should be pointed out that the majority of theses written by candidates for higher degrees in education as well as much other scholarly matter employed either the deliberative or the historical method for the obvious reason that measurement, statistical treatment, and objectivity of viewpoint—characteristic aspects of the scientific era—had not yet made their influence felt. In due time investigators accepted the trend of research activity, which heralded objective methods, including measurements and statistics, as the orthodox manner of approaching educational problems. In recent years, however, it has become apparent that the discard of the deliberative method was but a futile gesture or an endeavor to prevent the inevitable. Despite the reluctance to recognize its existence, it is beginning to appear that the deliberative method was not abandoned after all, but has continued to have a definite and indispensable function in research. There is, furthermore, along with the disposition to recognize the deliberative method, a noticeable trend toward reducing the disparity between qualitative and quantitative methods of research. The present purpose is, therefore, to outline the principal patterns of the deliberative method, to illustrate and evaluate these patterns, and thus to increase the usefulness of the method.

Classification of patterns was made inductively on the basis of analysis of approximately 300 selected articles reported in educational periodicals and a limited number of published dissertations in education. For practical purposes it was observed that four dominant patterns[3] would serve to classify the types found in this literature: (1) the *critical* pattern, (2) the *constructive* pattern, (3) the *critico-constructive* pattern, and (4) the *interpretative* pattern. The first three patterns may be regarded as typical aspects of the deliberative method. The last belongs properly within the deliberative method, even though it parallels criticism and theoretical construction less with respect to purpose and structure.

1. THE CRITICAL PATTERN

The critical pattern inspects existing theories, laws, or practices with a view to determining their strength or weakness or their appropriateness in the light of the evidence. Since the investigator's first task is to ascertain the present status of the problem and the current attempts at solu-

[3] It is recognized that no classification of functions is discrete. These patterns should be regarded as functionally continuous, that is, any research may be projected along the line of one or more patterns. The purpose of analysis of any function is to clarify its elements so that its usefulness may be enhanced.

tion, all constructive thinking must rest upon the basis of the critical pattern. By critically weighing the evidence for and against them, inadequate beliefs and assumptions impeding progress or endangering truth are detected. The investigator proceeds in the light of knowledge developed in the same or kindred fields: (1) to determine whether current solutions rest upon faulty assumptions or incorrect or inadequate data or (2) to judge whether they are fundamentally sound though incomplete.

The process is essentially the analysis of evidence in order to subject it to critical inspection and evaluation, especially where evidence points in more than one direction. If circumstances demand it, such judgment as this precedes constructive treatment as a means for indicating the most promising angle of attack. As a result, the difficulty arising from conflicting, erroneous, or inadequate evidence is isolated so that constructive thinking may proceed.

The procedure is essentially the same as that of the physician in diagnosing a disease or of a judge in evaluating testimony. Critical judgment is the core of the entire pattern. It calls for a superior type of thinker, for one who is intellectually and morally fitted to use sound judgment and to sacrifice personal bias in the search for truth.

A few examples will serve to illustrate the pattern. Cason[4] criticizes the laws of exercise and effect and attempts to "show that they do not fit the facts of learning." His technique is to determine what he considers vulnerable points in the two laws and to present evidence to indicate their weakness. Crawford[5] expresses "certain doubts as to the propriety of procedures now rather frequently observable in educational measurement." Numerous tests in several fields are subjected to searching criticism. The practice of using conclusions in situations to which they do not apply is challenged. There is a serious effort to weigh evidence before making a final appraisal.

Henmon[6] studies the trend of research activity in the typical college and university and expresses pessimism concerning the future, if the present attitude toward the function and value of research continues to

[4] Cason, H. "Criticism of the Laws of Exercise and Effect," *Psychological Review*, XXXI (September, 1924), pp. 397-417.

[5] Crawford, A. B. "Some Criticisms of Current Practices in Educational Measurement," *Harvard Teachers Record*, III (April, 1933), pp. 67-81.

[6] Henmon, V. A. C. "The Function, Value, and Future of Educational Research in Colleges and Universities," *Journal of Educational Research*, XXVII (March, 1934), pp. 493-502.

prevail. His approach is predominantly critical. In somewhat the same manner Symonds[7] outlines common faults in graduate research. In two of his studies Orata[8] critically analyzes the misuses and misconceptions of scientific and statistical procedures as applied to educational data.

The merit of the critical pattern is that assumptions are constantly challenged and subjected to analysis, much in the same way in which the physician is constantly testing with his seasoned judgment the efficacy of his remedies. The critical pattern tends to keep research purged of error and cautious in making assumptions and generalizations.

2. THE CONSTRUCTIVE PATTERN

The constructive pattern may develop a theory, formulate a law, create a point of view, or strengthen or improve an existing theory or practice. Its plan may be conceived in theory or in practice. The pattern proceeds to deal logically with available data and to carry forward thinking relative thereto in an orderly manner to its ultimate consequences, whatever they may be. Thus it seeks to lay bare the objective connections between conditions and outcomes. The pattern proposes and builds, basing its plans and anticipations upon a thorough knowledge and appreciation of present conditions and future needs.

Washburne,[9] for example, proposes an electro-chemical theory of learning as an improvement upon existing theories. He attempts, through reasoning by analogy, to discover a reasonable theory that correlates with known facts concerning the organism and its adjustment to the environment. He makes clear his assumptions, raises certain questions, and applies his theory to their solution. Sayers[10] employs this pattern in a study which is partially critical but predominantly constructive. The problem it proposes is "to study critically the nature of the separations and unities involved in various opposed educational

[7] Symonds, Percival. "Common Faults in Graduate Research in Education," *Journal of Educational Research*, XXVII (March, 1934), pp. 481-492.

[8] Orata, P. T. (1) "Begging the Question in the Name of Science," *Educational Administration and Supervision*, XX (April, 1934), pp. 241-263.
Orata, P. T. (2) "The Insignificance of the Statistically Significant," *Educational Administration and Supervision*, XX (May, 1934), pp. 321-340.

[9] Washburne, John N. "An Electro-chemical Theory of Learning," *Journal of Educational Psychology*, XXVI (February, 1935), pp. 99-122.

[10] Sayers, E. V. *Educational Issues and Unity of Experience*, Contributions to Education No. 357, New York: Bureau of Publications, Teachers College, Columbia University, 1929.

procedures, including their bearing upon the integrity of experiences." He analyzes the growing concept of unity and the principle of equilibrative interaction, finding in them a basis for comprehending and unifying many disconnected phenomena of experience. He thus arrives at a basis for studying educational theory and method, and thus formulates principles which hold promise of providing guidance in education. Wheeler[11] discusses in a positive manner certain problems of educational reconstruction. He shows how to guide the new functionalism into peaceful applications and to reconstruct the educational program to that end. He then proposes in the light of history certain changes in the curriculum and instruction, and concludes with a challenge to educators.

The merits of the constructive pattern lie in the fact that it prepares the way for future action. Theoretical construction proposes, and experience and experiment test its proposals.

3. THE CRITICO-CONSTRUCTIVE PATTERN

The critico-constructive pattern combines the critical with the constructive procedure. It attempts to clarify issues by analyzing errors in theory and practice in order that it may propose a better theory or practice to replace or supplement existing ones. It may, while evaluating existing conditions, lay the groundwork for determining opportunities for improvement, or support those conditions which are found to be satisfactory. The combined pattern appears to be favored over either the critical or the constructive used alone.

Although not in the field of education, the presentation of a "more adequate theory of space perception" by Koffka[12] is cited because the author is aware of his method of attack upon the problem and forcefully states it. He employs both criticism and construction. He gives due recognition to experimentation and the relation that should exist between it and deliberation. He attempts specifically to clarify the problem by analyzing limitations in current theories in order that he may propose

[11] Wheeler, R. H. (1) "Problems of Educational Reconstruction. I. The Issue," *Educational Administration and Supervision*, XI (January, 1935), pp. 32-44.

Wheeler, R. H. (2) "Problems of Educational Reconstruction. II. An Outline of New Objectives," *Educational Administration and Supervision*, XXI (October, 1935), pp. 497-506.

Wheeler, R. H. (3) "Problems of Educational Reconstruction. III. Freedom and Ethics under Natural Law," *Educational Administration and Supervision*, XXI (November, 1935), pp. 582-591.

[12] Koffka, K. "Some Problems of Space Perception," *Psychologies of 1930*, ed. C. Murchison (Worcester, Massachusetts: Clark University Press), pp. 161-185.

what he regards as a more adequate theory. Kilpatrick[13] deals with the problem of public education as a force for social improvement in the effort to find an answer to the question of what the schools can do and how they may be a force for social improvement, granted there is a need for a new social order. After stating his own position and that of various groups, he proceeds to criticize certain typical proposals. He concludes with a constructive proposal as to what is needed and what the schools can do. His study criticizes and proposes. Russell[14] faces another problem of the schools and the government in the question of federal aid. In dealing with his problem he blends criticism with constructive proposals. Demiashkevich[15] seeks to show the relationship between philosophy and the philosophy of education, and to show the need for a revitalized philosophy of education. He evaluates philosophy and philosophical concepts, and proposes a use for academic philosophy in the development of educational theories and practice.

The critico-constructive pattern revitalizes issues in the field of education. It has the merit of being both destructive and constructive, both negative and positive. When carefully done, the pattern is not difficult to check, for it presents all sides of a problem and must obviate its criticisms before making proposals.

4. THE INTERPRETATIVE PATTERN

Although not typically deliberative, interpretation is essentially a reflective activity and is, therefore, to be included as an aspect of the deliberative method. This pattern interprets the ideas of a particular man or group of men as revealed in their writings or practices. It may interpret a movement or an educational philosophy. It does not criticize in the sense of showing what is wrong, nor does it sponsor or propose that which is being interpreted, although incidental critical or constructive statements are to be found. Frequently the pattern attempts to harmonize divergent or variant philosophies or movements by indicating their points of agreement and conflict, thus showing relationships. The primary purpose in all research is to reveal and to clarify an original concept, theory, philosophy, or movement.

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[13] Kilpatrick, W. H. "Public Education as a Force for Social Improvement," *School and Society*, XLI (April, 1935), pp. 521-527.

[14] Russell, W. F. "Federal Aid—Boon or Bane," *Teachers College Record*, XXXV (April, 1934), pp. 541-552.

[15] Demiashkevich, M. J. "Philosophy and the Philosophy of Education," *Educational Administration and Supervision*, XVIII (February, 1932), pp. 115-124.

Cole[16] synthesizes the educational and philosophical theories of Herbart and Froebel. His procedure is to discuss the philosophy of each man, to investigate and set forth the possibility of a philosophic synthesis, and to attempt an educational synthesis. He seeks to reveal the ideas of these two men for the purpose of establishing harmony between their divergent philosophies. Leland[17] employs a slightly different form of the pattern in a study of the educational theory and practice of T. H. Greene. He first evaluates Greene's ethical, social, and political philosophy, appealing to critics and other interpreters. He then evaluates his educational theory and practice. After summarizing Greene's philosophy the author points to implications in that philosophy for education and evaluates Greene as an educator. Carr's[18] study illustrates an attempt to harmonize a philosophy of education and the theories of Gestalt psychology. He analyzes the principal hypotheses of Gestalt psychology, especially as they may be applied to modern movements in the science and art of education. He summarizes the philosophy on which progressive teaching is based and shows how the Gestalt theory supports this philosophy.

Critical judgment assumes an important role in this pattern, although it is not the same sort of critical activity which is the basis of the critical pattern. The value of the procedure, however, depends on the quality of judgment as well as on accuracy in developing a true picture from a variety of sources.

The adequacy of these patterns is fairly well assured, since it has been found possible to classify all deliberative investigations under one or the other of the four patterns. They are offered as a positive step in the direction of a definite and formal organization of the deliberative method for dealing with certain problems in education. They bring to attention an aspect of research which needs more careful consideration and may serve as means for stimulating greater interest in this type of research by placing it on a more dignified basis. Research of this type

[16] Cole, P. R. *Herbart and Froebel: An Attempt at Synthesis.* Contributions to Education, No. 14, New York: Bureau of Publications, Teachers College, Columbia University, 1907.

[17] Leland, A. P. *The Educational Theory and Practice of T. H. Greene.* Contributions to Education, No. 46, New York: Bureau of Publications, Teachers College, Columbia University, 1911.

[18] Carr, J. W. "Relationships of Theories of Gestalt Psychology and Those of a Progressive Science of Education," *Journal of Educational Psychology*, XXV (March, 1934), pp. 192-202.

is of a high order and contributes materially to the sum of educational knowledge. Synthesis, evaluation, and interpretation of the facts disclosed by educational fact finders call for the best educational thinkers.

As a result of the classification of these patterns the student of research may be sent directly to type studies which illustrate such patterns and may study their procedures. In any discussion of the process of the deliberative method the student is so likely to be confused by terminology that he gains little of practical nature from a discussion of the method. It is the belief of the writers that these patterns will do more to clarify the process than a lengthy discussion of such mental processes involved in the method as synthesis, discrimination, association, etc., important as the latter may be from a theoretical viewpoint.

A COMPOSITE INDEX TO MEASURE THE EDUCATIONAL EFFORT OF SCHOOL DISTRICTS

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THE effort expended by school districts to provide school facilities and an adequate program of work for those of school age in the community has been given various meanings in educational usage. Whenever the people in the school districts in any area are free to initiate the types of schools they prefer, then that district which maintains twelve grades is displaying greater educational effort than another which maintains fewer than twelve grades. That is effort directed toward adequate school organization. The term, effort, may refer also to the scope and the variety of the programs of work offered in the school districts to be compared. It seems reasonable to say that a community which offers its pupils a rich program of fine and practical arts, medical, dental, and health services, guidance in the development of ethical character, and training in the habits of good citizenship, is exerting a greater educational effort than is another community which offers its pupils very little beyond the three R's taught formally by the memorizing textbook-testing method. Many one-room rural schools do the latter and no more.

RELATION OF SCHOOL ORGANIZATION TO EFFORT EXPENDED

There are three types of school organization provided by the small communities in North Dakota, each accompanied by a peculiar program of work, to which it is largely limited. These types are: (1) four-year high schools with eight lower grades managed in the same unit, (2) consolidated-graded schools with less than twelve grades, and (3) one-room rural schools. There are also a few junior-senior high schools in the larger communities in the state. The districts in which these schools are located provide programs of work which differ greatly in degree of adequacy. The effort in these schools is limited by the total number of grades provided, due to the type of school organization used. It would be impracticable for the districts which now maintain one-room schools to maintain high schools, because there are too few pupils residing in each district to create the necessary social situation for approved high

school work, although some of them would be just as able financially to offer high school courses as the consolidated-graded schools are.

TWO DISTINCT TYPES OF EFFORT

Thus, effort to support education may be shown by the type and quality of the school facilities and the school program of work provided. Effort may be indicated also by comparing the financial abstinence practiced by the districts in supporting their schools. The financial effort of a school district may be estimated (1) by the amount of the tax rate levied on taxable property, (2) by the amount spent for each pupil for school purposes, or (3) by the ratio of the expenditures per pupil to the taxable valuation per pupil. The measure of financial effort which is employed should reveal the extent to which districts are using their financial ability per pupil to secure such educational facilities as will best meet the needs of the individual pupils after these have been discovered by research. A comparison of the expenditures per pupil in several districts, alone, will not reveal true effort, first, because school districts with equal expenditures per child enrolled may differ much in the relative effort put forth to raise the money they spend, and second, because the proportion of children of school age to adults may differ much in the communities compared. Hence, it is better to measure effort in terms of both expenditures per pupil and financial ability per pupil.

Examples of the application of these methods will make them somewhat clearer. In North Dakota the legal maximum mill rate for current expenditures of schools is 18 mills on the assessed valuation in districts which maintain four-year accredited high schools, 16 mills in those which maintain consolidated-graded schools that are not classified as four-year high schools, and 14 mills in districts which conduct one or two-room rural schools. When 60 percent of the electors who are voting on the question at any regular or special election decide to do so, they may levy 50 percent more than the legal maximum. The levies made for interest and principal on bonds for school building purposes are in addition to the legal limits mentioned. In relation to effort, it is probably true that a school district which levies the legal maximum is demonstrating a greater effort to support schools than one which levies less than that amount; and a district which votes to levy 50 percent in addition to the legal maximum is exerting more effort than one which levies the legal maximum.

When effort is measured only in that manner, its measurement dis-

regards the differences in the proportions of the total population of the districts compared, whose needs are being supplied by the money spent, because of their enrolment in school. For example, E. F. Sather in his study of the conditions in McLean County, North Dakota, discovered one district which was levying three times as much per pupil for current expenditures as another district in the same county. Both districts were in the same classification according to the type of school organization maintained. Both were pointing their efforts toward the adequate maintenance of four-year high schools. This matter of expenditures per pupil rather complicates the measurement of effort. In McLean County, the consolidated-graded school district which had the highest enrolment had the lowest expenditures per pupil; but the one which had the second highest enrolment had the highest expenditures per pupil. In this area, there is no uniformity among districts of approximately the same ability in regard to the gross financial effort which they put forth to support schools, even when the relative number of pupils enrolled is not considered. Hence, when this additional complicating factor of number of pupils is considered, the effort put forth by the districts becomes still more difficult to estimate. For instance, there is one one-room school district in McLean County which spent 18 times as much per pupil in one year for current expenditures as another one-room school district in the same county.

A comparative ratio for several school districts of the expenditures per pupil enrolled to the wealth or income per pupil enrolled would be a better indication of the relative effort put forth than are either expenditures or wealth alone. In cases in which all the districts compared are able to pay for whatever program of work seems reasonable to them, the financial effort involved in providing their several programs may be measured partly by their relative mill levies for current expenditures. Of course, if some of them enroll many more pupils than others, then that part of the levy which is used to provide the ordinary traditional program of subjects may have to be a larger proportion of the total money expended in those districts which have the largest enrolment. Thus, such districts would have to put forth a greater effort than the others in order to provide programs of work of the same adequacy.

COMPOSITE INDEX OF EFFORT

If a district ranks first in the county in taxable valuation per pupil, and first in current expenditures per pupil, then it is putting forth

effort roughly in proportion to its ability to support schools. Hence the ratio of expenditures per pupil to taxable valuation per pupil partakes somewhat of a composite index. In order to make it still better,

TABLE I

A Composite Measurement of the Educational Effort of All School Districts in Williams County, North Dakota

Average for Five Years, 1930-1934

Ratio of Average Current Expenditures Per Pupil to Assessed Valuation Per Pupil Enrolled	Numbered School Districts Which Expended the Designated Ratios of Their Wealth Per Pupil Enrolled When Making the Following Levies in Mills for Current Expenditures												
	4-5.9	6-7.9	8-9.9	10-11.9	12-13.9	14-15.9	16-17.9	18-19.9	20-21.9	22-23.9	24-25.9	26-27.9
.0270-.0279												s 90
.0260-.0269												
.0250-.0259											s 1	
.0240-.0249												
.0230-.0239										s 2		
.0220-.0229								s 15		s 64		s 95
.0210-.0219										s 94		
.0200-.0209										s 13		
.0190-.0199												
.0180-.0189						s 40	s 41,70		s 75,78			
.0170-.0179									s 14			
.0160-.0169									s 80			
.0150-.0159				s 17	s 83	s 86			s 37	s		
.0140-.0149					s 23	s 76	s 24	s 88,81	s 66			
.0130-.0139					s 97			s 18				
.0120-.0129				s 46,77	s 36,92 s 31,35		s 3					
.0110-.0119				s 39	s 79	s 59	s 93					
.0100-.0109			s 16,38	s 96	s 4,33,65	s 34	s 73	s 1				
.0090-.0099		s 72	s 43	s 63,29 s 42,82	s 85							
.0080-.0089		s 84	s 5 s 44,62									
.0070-.0079			s 30	s 6								
.0060-.0069	s 89	s 87		s 7								
.0050-.0059	s 28											

however, the relative tax rate levied by the several districts should be considered also in any index. A composite index of effort to provide schools in Williams County, North Dakota, which takes into account all three of the factors mentioned, namely, (1) current expenditures per pupil, (2) assessable valuation of property per pupil, and (3) the relative tax rates for current expenditures of the districts compared is presented here as a suggested technique for making somewhat clearer the complex concept of the educational effort of school districts.

A brief explanation of how Table I is to be interpreted should make its application clearer. In general, districts which appear in the table near the top and far to the right are exerting relatively the greatest effort to support their schools. There are two reasons why the districts do not appear as a straight line graph in the table. First, it is because certain districts which have money in their treasuries levy a smaller amount than they are spending, thus reducing the true effort exerted. Second, there are numerous districts in which delinquent taxes are a matter of serious concern. Such places levy more money than they expect to get and more than they intend to spend. That is translated into a higher tax rate than would be necessary if there were no delinquency. Then those who pay their taxes pay enough to make up for those who do not. By comparing some of the districts in Table I, this distinction becomes obvious. For example, District 17 and District 25 both spent from 150 to 159 ten thousandths of their assessed valuation for current expenditures as an average for five years. But the latter district exerted its taxing power to the extent of 23 mills, thus showing much more effort than the former district with its levy of 11 mills.

SUPERVISORY PROCEDURES AND THEIR RELATIVE DESIRABILITY

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I.

MUSIC supervision is a service agency to music teaching whose aim is to improve the music teacher and the teaching act, thereby enhancing the usefulness of the school and music education to the child. Supervision of music instruction means the improvement of the music teacher and her teaching. Its purpose is to benefit the teacher and thereby benefit the child.

Supervision of music instruction consists of at least five very definite elements:

1. Knowledge of what constitutes good music teachers, and good music teaching. This includes the music supervisor's knowledge of music; of psychology of childhood and psychology of learning; of the personal, social, and professional traits requisite for successful teaching; of standards of technique of music instruction and classroom management. This infers, then, that the music supervisor must be able to recognize a good music teacher and good music teaching when he sees it.

2. Due commendation when standards are met.

3. Ability to analyze a situation and diagnose or evaluate its parts. The music supervisor must serve the teacher of music in a similar capacity to that in which a coach serves a football team. He must sit on the side-line where he can get a general overview of the situation, where he can get a better perspective of a whole situation than can the music teacher, and in that position see the teacher and her work as she will never be able to see herself. Just as the coach must be able to tell not only that his team is losing, but why and wherein it is losing, so must the music supervisor be able to tell not only that the teachers's work is not as efficient and successful as it might be, but why and wherein she is wasting time and energy or is using poor technique.

4. Determining the order of treatment of weaknesses, or planning the attack. The weaknesses to be treated first will usually be those that are most fundamental or propaedeutic to the strengthening of others. It may be however, that the ones to be treated first will be those that are most expedient.

5. Treating the weaknesses.

II.

Assuming that the music supervisor has followed the first four steps and has diagnosed a teaching situation, then what is he going to do about it? What supervisory agencies will he use in attempting to remedy a situation? It is the aim of this article to attempt to determine the relative desirability of various standard supervisory procedures.

A number of surveys have been made which gather opinions of teachers concerning supervisory activities employed by their supervisors and which teachers found most beneficial to them. Other surveys have been made which gather the estimates of supervisors concerning the relative desirability of practices they have employed. Educational literature contains also a number of expressions of opinions on the subject and a number of descriptions of supervisory programs and supervisory procedures. An attempt is made in this article to combine the findings of the better surveys into the composite.

At the outset the writer believes it pertinent to state that the data herein have to do with general supervision. Research in the field of music supervision has not come along very rapidly and at this date there are no reports worthy of consideration which have their setting specifically in music education and music supervision. As a music supervisor and critic teacher of music, the writer has found that the general educationalists have paved the way for scientific music supervision. Procedures valid in general supervision have proven just as valid in music supervision. In other words, that which has proven good in general supervision has been found to be good in music supervision for it is the principles involved and not the specific settings of the researches that are recommended in this article.

Several of the surveys that have been reported cannot be used in making this composite because of the manner in which the data are reported. Some of these surveys are reported in terms of percentages, and some avoid the use of figures entirely and simply report the relative desirability of different supervisory agencies in order of rank of importance. Studies reported in percentages cannot be included because percentages cannot be added. Studies reported in ranks cannot be included because when two or more of the activities listed in a study are translated into terms of a single activity there is no reliable way for determining what rank to give the combination. There are a number of surveys that have been reported in terms of frequencies of expressed preferences by teachers or supervisors. The findings of these researches

can be combined by adding the frequencies Studies of this type are included in the bibliography and only these studies are included in the composite attempted in this article.

The process of combining the findings of the various surveys is not an easy one. Its difficulty can hardly be appreciated by any one who has not actually experienced it. Only the major steps taken in the process of combining the various findings will be considered here.

III.

First Major Step.—An analysis of the various articles reported in the bibliography give a list of some fifty supervisory activities, not to mention many purely administrative procedures that were included in the lists. The activities included in the long array are not all wholly different. Many were quite similar but stated in a different language. Others are somewhat different but still so familiar that they can very properly be grouped under a single heading. The first step, therefore, in preparing a composite of the different reported surveys is that of telescoping the long list of activities. The telescoping resulted in a list of ten major activities or procedures which supervisors employ in an effort to strengthen the weaknesses of their teachers. The ten major activities and their explanations are as follows:

1. Visitation, conference, and criticism (including typed supervisory notes sent to teacher in lieu of conference; stenographic report of visit in lieu of a visit)
2. Demonstration teaching
   a. by supervisor
   b. by others, but upon direction and under supervision of supervisor.
3. Teachers' meetings (local or not local; building or group of buildings; departmental or general, etc.)
4. Letters (usually circular) and bulletins (including reports of case studies, model lessons, etc., sent by supervisor, and reports, daily schedules, etc., sent by teachers)
5. Administrative provisions to improve usefulness of teachers.
   a. provisions and distribution of equipment and supplies, including teachers' aids
   b. exhibits, museums, county and local festivals and other agencies to incite emulation
   c. rating teachers

d. departmentalization
e. transferring teachers to other buildings or other branches of service.
f. financial inducements; salary schedules, bonuses, pensions, merit system of promotion, permanent tenure
g. preparing teacher-leader and teachers needing help.
h. freedom from mechanical work on tests and reports
i. adjusting teaching loads of teachers
j. intensive campaign with outside "expert" in charge
k. sabbatical leaves
l. certification of teachers
m. temporary exchange of teachers with another system.
n. pay on twelve-month basis; work three-fourths and study or travel one-fourth
o. let a whole room visit another for such purpose as (1) to see other kinds of instruction; (2) bridge gap between grades; (3) emulate deportment
p. teacher participation in administration
q. classification and adjustment of pupils

6. Directing work of teachers
   a. preparing lesson plans or outlines for teachers to follow
   b. definite assignments at beginning of term
   c. following good courses of study
   d. inspecting daily and unit lesson plans, schedules, etc.
   e. assigning little tasks such as: keeping records of time spent in reviews, developments, assignments, supervised study, etc., or preparing lesson if assignments are too long.
7. Self-supervision or supervision by fellow teachers
   a. spontaneous intervisitation
   b. teachers in similar lines of work getting together and comparing notes.
   c. teachers closely associated giving suggestions
   d. professional organizations
   e. professional ethics
   f. concentration on one or two problems each week and writing reports on how you solved them and report same to supervisor when he calls
   g. anticipatory teaching
   h. student rating

i. study groups and study clubs
j. giving standardized or other measurements and competing with own record.

8. Directing professional reading and supplying professional reading material.
   a. supplied by school professional library
   b. supplied by teachers pooling own magazines and books
9. Group and individual research and work of research bureaus
   a. incitement of writing for magazines, lecturing, or making contributions to local school systems and receiving due credit therefor
   b. participation in course-of-study-making
   c. activity of supervisory force in spreading good of one to all, with acknowledgment
   d. participation in making of teacher-improvement sheets
10. Out-of-school agencies
   a. summer school
   b. vacations
   c. travel
   d. lectures and concerts, chautauquas
   e. extension courses, by correspondence or in residence
   f. participation in community affairs

IV.

Second Major Step.—The second and most difficult step of making the composite of the surveys consisted of translating the items listed in the reports of the surveys into terms of the telescoped list. Reports of surveys made by different investigators do not use a common language. Two investigators will consider the same agency, apparently, but will call it by different names. It becomes necessary, therefore, to translate the terminology used by the different researches over into a common terminology, and the common terminology is that of the telescoped list. Also, within the report of a single survey there are often found two different items which are closely related, and these are translated and put together as one under a heading found in the telescoped list.

Many things were included in the reports of the various investigations which for some reason or other did not belong in the studies at all. These things, therefore, were not included in the final composite. They

TABLE I

Composite of Thirty-one Investigations Concerning the Relative Desirability of Supervisory Procedures

	Estimates by Teachers														Estimates by Supervisors															Estimates by Others					Total	
Procedures	Ayer	Barr and Spain	Conner	Cook	Hughes and Melby	Melby	Morrison	Morrison and Others (1)	Morrison and Others (2)	Nutt	Valentine	TOTAL	RANK	Barr and Spain (1)	Barr and Spain (2)	Dyer	Fox	Hall	Huff	Koch	Longshore and Others	Melby	Morrison	O'Connor	Perrin	Redford	Taylor	Trabue	Whitney	TOTAL	RANK	Barr and Spain	Briggs	Daily	Melby	TOTAL	RANK	FINAL TOTAL	FINAL RANK
V	21	554	163	59	228	459	216	10	1010	259	356	3335	1	427	1841	609	71	293	115	1895	1001	165	71	72	31	205	73	133	127	7129	1	348	122	2	97	569	1	11033	1
T	5	279	64	..	12	80	65	.	790	44	215	1554	3	167	842	1410	..	..	123	1039	272	57	21	32	..	310	86	...	109	4468	2	154	63	..	37	254	3	6267	2
D	6	317	...	30	12	152	...	32	360	120	275	1304	4	353	824	1467	22	32	65	49	232	34	97	..	3	....	..	8	37	3223	3	187	57	2	36	282	2	4809	3
G	..	..	..	..	9	378	...	14	1665	1	116	2183	2	...	....	639	..	..	91	....	....	127	..	..	..	..	..	..	20	877	8	...	..	..	8	126	134	5	3194	4
R	..	....	..	3	7	116	12	..	....	14	98	250	7	356	....	815	..	..	86	1095	....	39	28	..	..	145	44	1	39	2648	4	...	17	..	14	31	9	2929	5
A	..	..	43	7	11	117	8	12	....	41	297	536	6	...	....	678	..	..	180	4	446	39	6	10	1	161	42	..	122	1689	5	...	..	2	11	13	10	2238	6
W	..	152	...	3	...	...	...	..	....	202	356	713	5	210	317	....	..	373	...	5	....	..	..	..	..	325	46	1	10	1287	7	95	43	..	..	138	4	2138	7
S	..	....	..	..	..	160	...	..	....	..	52	212	8	..	....	882	..	..	118	345	....	71	..	..	..	80	20	..	11	1527	6	...	..	1	51	52	7	1791	8
O	..	....	..	..	..	144	...	..	....	..	44	188	9	..	....	458	..	..	70	....	....	46	..	..	..	..	..	13	70	657	9	...	25	1	30	56	6	901	9
L	11	..	..	..	..	66	21	..	....	..	67	165	10	190	....	335	7	33	19	9	....	28	2	..	1	..	..	..	14	638	10	...	17	..	24	41	8	844	10

Code:

V—Visitation, conferences and criticism
D—Demonstration teaching
T—Teachers' meetings
L—Letters and bulletins
A—Administrative provisions
W—Directing the work of the teachers
S—Self-supervision and supervision by fellow teachers
R—Directed professional reading
G—Group and individual research
O—Out-of-school agencies

were not translated into terms of any of the activities of the telescoped list. The type of things that were omitted are the following:

1. Some of the studies confuse supervisory agencies with supervisory results. They seem to have mixed means with ends. An example of this is an item such as "training in specific projects." Since this composite is endeavoring to determine supervisory activities or means, supervisory results or ends were not included.

2. A number of indefinite means were listed in some of the reports, and these could not be classified satisfactorily. An example is "creating an ideal." The question is, then, how was the ideal created? Was it by means of personal conferences, teachers' meetings, directed reading, circular letters, or some of the other standard agencies?

3. Some of the reports include what might be classified as attitudes, which should ordinarily be included in the fundamental assumptions of supervisory policies and cannot be included as agencies which music supervisors might employ to improve a teacher in service. An example of such an item is "willingness to listen."

4. Some investigators fail to distinguish between devices in seeing and devices in treatment. The composite attempt in this article intends to include only devices in treatment. An example of a device in seeing which is rather common in some researches is "giving of standardized tests."

5. Some researches reported include items which pertain to the direct relationships which supervisors have with pupils. *Supervision is considered by modern thinking as the improving of pupils through the improvement of teachers,* and in the light of this definition of supervision, the activities which the music supervisor performs in direct relationship with the pupils cannot be considered as improving the teacher in service.

6. A number of purely administrative activities which have nothing to do with the supervision of music instruction were found in the reports and could not be included in the composite. An illustration is "conference with parents."

V.

Third Major Step.—The third major step in preparing a composite of the researches in relative desirability of supervisory procedures is that of adding the frequencies after the items of the separate researches have been translated into the terms of the telescoped list. With frequencies added, the order of relative desirability of supervisory procedures is apparent. The composite of the several researches are shown in Table I.

The frequency after an item and under the name of an investigator was found by combining all the frequencies of the investigator's table that were translated into terms of the particular item of the telescoped list.

It is admitted that the items of the original investigations are subject to interpretations other than those made here. The ease of translating some of the more evident items makes any serious differences in results that might be obtained by repeating the process quite unlikely. As a check on the reliability of the telescoping only once, the same task was undertaken twice, the second at a later period. The telescoped list made the second time consisted of ten activities, and nine of the ten were identical to ones in the list made in the first attempt. The translations made the second time did not differ materially from those made the first time. The nine appeared in similar order in the two final composites arrived at independently. The correlation between the two (Spearman Footrule Formula) was found to be .994.

The composite in Table I has the teachers' estimates of supervisory procedures, the supervisors' estimates, the other estimates, and the totals reported separately. This makes it easy to compare points of view held by the different groups. The Spearman Footrule Formula applied to the four rankings gives the intercorrelations shown in Table II. All correlations are positive.

TABLE II

INTERCORRELATIONS OF RANKINGS OF SUPERVISORY PROCEDURES AS FOUND IN ESTIMATES BY TEACHERS, SUPERVISORS, OTHERS, AND TOTAL

Group Estimating	Supervisors	Others	Total
Teachers	.75	.69	.94
Supervisors		.44	.94
Others			.61

The method of adding frequencies is not the only one that could have been used in making the composite. The ranks of individual items found in the individual researches could have been added as a means for determining the composite ranking. If this method were employed the agency having the smallest number of rankings would be the one that stands at the head of the list. Only two of the investigations, those by Valentine and Whitney, reported frequencies after all of the ten agencies. Therefore, if the rank method of making the composite were used, all items not included in the report of an individual investigation should be given the rank just lower than the lowest of the ones that are reported.

For example, the investigation by Miss Ayer has frequencies after only four agencies, and if the rank method were being employed to determine the composite, all other items should be given fifth rank in the column representing Miss Ayer's investigation.

It probably does not make much difference which method, sum of frequencies or sum of rankings, is used to determine the composite. The method of adding frequencies assumes that the greater weight should be given to the studies that have the larger number of frequencies. The method of adding rankings assumes that all of the investigations included in the composite are of equal merit regardless of the number of frequencies of each. Only one of these two methods, the method by adding frequencies, is shown in Table I. To show both methods would be complex and unnecessary. The final rankings of the ten items in the telescoped list by the method of adding rankings of individual studies is 1, 2, 3, 8.5, 4, 5, 10, 6, 8.5, 7. The coefficient of correlation between the final ranking by this method and the final ranking shown in Table I is .836.

VI.

Conclusion.—The relative desirability of the ten agencies of the telescoped list is found by the method employed in this article to be in the following order:

1. Visitation, conference and criticism
2. Teachers' meetings
3. Demonstration teaching
4. Group and individual research
5. Directing professional reading
6. Administrative provisions
7. Directing the work of teachers
8. Self-supervision and supervision by fellow teachers
9. Out-of-school agencies
10. Letters and bulletins

Six of these ten agencies are worthy of consideration by music supervisors. Four of the ten, administrative provisions, out-of-school agencies, directing the work of the teachers, and directing professional reading, are not considered by the writer as important to music supervisors because of several reasons.

Administrative provisions (rank 6) in the strictest sense are not supervisory procedures. *Most administrative provisions of music education do not improve the pupils by improving the teacher; they improve*

pupils by improving the teaching. Most administrative procedures do not make the teacher better; they simply enable the teacher to work to the maximum efficiency. Instruction is improved by administrative procedure but the improvement is not because of the growth of teachers in service.

Out-of-school agencies (rank 9) are not truly supervisory procedures because they are out of school. The improvement that results from out-of-school agencies is not through supervision. Out-of-school agencies are factors contributing to the growth of teachers but they can hardly be classified as supervisory procedures. There is no technique for the supervisor to master in the use of out-of-school agencies.

Directing the work of teachers (rank 7) conflicts with the principles of supervision. Directing the work of teachers is philosophically unsound. Almack and Lang say that the poorest type of supervision is where the teachers simply follow formal instructions and courses prepared by supervisors.[1] Directing the work of teachers does not help them to grow except to help them grow passive and dependent. Directing the work of the teacher is not supervision; it is "stuporvision."

Directing the professional reading of teachers (rank 5) is a legitimate and useful supervisory device but the technique of using the device is very simple. For certain kinds of supervisory programs this device is indispensable. The music supervisor should not rely upon it unless the reading is done along lines specifically appropriate to a particular school where a supervisory program is being advanced, or specifically appropriate to a particular teacher's needs.

VII.

Summary and Recommendations.—Visitation, conference and criticism, teachers' meetings, demonstration teaching, group and individual research, self-supervision and supervision by fellow teachers, and letters and bulletins are all worthy supervisory procedures which have proven to be valuable in the improvement of the teacher and the teaching act. The music supervisor will profit greatly by studying the technique of employing these procedures in his work. If music education is to keep pace with the advance of the art and science of education, the adoption and skilled usage of the procedures is timely. Supervision requires an entire repertory of techniques in addition to that used in music teaching.

[1] Almack, John C., and Lang, Albert R. *Problems of the Teaching Profession.* (Boston: Houghton, Mifflin, 1925), pp. 139-140.

The field of music supervision is unlimited in research possibilities. Music supervision must be scientific, and to be scientific, standardized and objectivated means of diagnosis and analyzing teaching must be employed. Music supervision must be democratic, it must recognize the individuality of the teacher and must attempt to save a poor but otherwise worthy teacher instead of dismissing her. When a teacher is dismissed she will go to another school system and music education in general will not have been benefited by her change. Last but not least, music supervision must be unified. No music supervision can insure progress when too many supervisors are working at cross purposes. Also, the music supervisor cannot limit his supervisory activities to one or two procedures and feel assured that he is doing his duty as a supervisor.

Since most teachers welcome supervision it is difficult to see why the supervisory program should not be whole. Much of the responsibility of a successful supervisory program lies in the skilled usage of the supervisory procedures found to be desirable in this study.

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GRADE PLACEMENT OF PROBLEMS OF LIFE

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Introduction

The importance of relating the school experiences of pupils closely to the actual problems of life of children and adults is receiving increased attention. The purpose of this article is to present problems of life in nine major areas of human activity as they have been allocated to centers of emphasis for grades one through twelve. The problems of life listed for the various grades may well be made the basis for a dynamic core-curriculum for elementary and secondary schools.

The nine major areas of human activity[1] used in this article resulted from an analysis of 38 classifications of the activities of human life. The centers of emphasis for grades one through twelve[2] are based on a study of 31 good recent courses of study and 163 outstanding recent textbooks.

Most of the problems of life[3, 4] presented in this article resulted from an analysis of 15 recent books and research investigations and 145 outstanding recent textbooks emphasizing problems of life. Many of the problems of life resulting from that analysis were stated well for use in this article. Other problems were re-worded or otherwise changed to some extent to make them best adapted for use in the grades to which allocated. A considerable number of new problems were added in the elementary grades by a committee of four persons very familiar with the interests and needs of elementary school children.

This committee of four persons selected, worded, and allocated the problems of life to grades one through twelve on the basis of the following five criteria:

1. Each problem should be definitely related to the center of emphasis to which it is allocated.

[1] Frederick, O. I., and Farquear, Lucile J. "Areas of Human Activity," *Journal of Educational Research*, XXX (May, 1937), 672-679.

[2] Frederick, O. I., and Musselwhite, Lloyd Pace. "Centers of Emphasis for Grades One through Twelve," *Journal of Educational Research*, XXXII (October, 1938), 123-130.

[3, 4] Frederick, O. I., and Farquear, Lucile J. "Problems of Life, I and II," *School Review*, XLVI (May and June, 1938), pp. 337-345 and 415-422.

2. Each problem should be sufficiently comprehensive to provide for a large number of vital activities and interesting comparisons and relationships.
3. Repetition of problems should be avoided unless treated in a different way.
4. Overlapping of problems should be eliminated to the extent feasible, but one problem should lead naturally into others.
5. The problems should provide for continuous progress in the development of the pupils from grade to grade.

The problems of life allocated to each of the grades may be used singly as the basis for developing units of work or two or more of the problems may be combined to make a larger unit. On the other hand, some of the problems may be made the basis for more than one unit each. The problems of life in a given grade may be considered in whatever order seems best adapted to the interests and needs of the particular class concerned. No class is expected to undertake all the suggestive units of work for a given grade and hence the most suitable problems of life for the given group of pupils should be chosen by the teacher and the pupils. The teacher should feel free to develop and use vital problems of life not listed. The aim is to provide many important and interesting problems of life from which the teacher may choose, to encourage flexibility, and to give the teacher ample opportunity to exercise initiative.

The suggestive problems of life allocated to grades one through twelve constitute the remainder of this article.

PROBLEMS OF LIFE IN VARIOUS AREAS OF HUMAN ACTIVITY ALLOCATED TO CENTERS OF EMPHASIS FOR THE DIFFERENT GRADES

GRADE I

Areas of Human Activity	Center of Emphasis *Life in the Home and School.* (Life of children, adults, plants, and animals)
	Problems of Life
I. Protecting Life and Health	Keeping healthy and safe at home and at school
	Making the home and school more healthful and more safe
II. Making a Home	Building and furnishing a home and working and playing with others in the home
III. Conserving and Improving Material Conditions	Using fire, heat, light, and water in the home and school
	Caring for plants and animals in the home and school

IV. Coöperating in Social and Civic Action	Working with others in the home and school and respecting their rights
V. Getting a Living	Becoming better acquainted with food, shelter, and clothing in the home and school
VI. Securing an Education	Getting acquainted with the school
VII. Expressing Religious Impulses	Enjoying seasonal holiday activities and appreciating the meaning of the holidays
VIII. Expressing Aesthetic Impulses	Choosing and making beautiful things and using them in the home and school
IX. Engaging in Recreation	Engaging in wholesome forms of recreation in the home and school

GRADE II

Areas of Human Activity	Center of Emphasis *Life in the Immediate Community.* (Life of children, adults, plants, and animals) Problems of Life
I. Protecting Life and Health	Protecting ourselves and others in the community from diseases and accidents
II. Making a Home	Living in various kinds of homes in the community
III. Conserving and Improving Material Conditions	Finding how fire, heat, light, and water are provided and used in the community Getting acquainted with plants, animals, and land features of the community
IV. Coöperating in Social and Civic Action	Working with others in the community and respecting their rights
V. Getting a Living	Getting a living in the community
VI. Securing an Education	Using community agencies to enrich school experiences
VII. Expressing Religious Impulses	Attending and taking part in religious services and activities in the community
VIII. Expressing Aesthetic Impulses	Expressing beauty in the everyday life and experience of the community
IX. Engaging in Recreation	Engaging in wholesome forms of recreation in the community

GRADE III

Areas of Human Activity	Center of Emphasis *Life in the County, State, and Nation.* (Life of children, adults, plants, and animals) Problems of Life
I. Protecting Life and Health	Coöperating with county, state, and national health and safety agencies

II. Making a Home	Comparing homes and home life in various parts of the county, state, and nation
III. Conserving and Improving Material Conditions	Caring for land, plants, and animals in various parts of the county, state, and nation
IV. Coöperating in Social and Civic Action	Comparing social and civic activities in various parts of the county, state, and nation
V. Getting a Living	Getting a living in agricultural sections of the state and nation Getting a living in mountainous sections of the state and nation Getting a living in manufacturing sections of the state and nation
VI. Securing an Education	Comparing schools in various parts of the county, state, and nation
VII. Expressing Religious Impulses	Comparing religious customs and moral attitudes in different parts of the nation
VIII. Expressing Aesthetic Impulses	Enjoying, reproducing and creating the arts representing life in the various parts of the nation
IX. Engaging in Recreation	Comparing recreation in various parts of the country

GRADE IV

Areas of Human Activity	Center of Emphasis *Influence of Different Physical Environments on Life.* (Life of children, adults, plants, and animals in our state, our nation, and other parts of the world)
	Problems of Life
I. Protecting Life and Health	Keeping healthy in different physical environments Preventing accidents in different physical environments Protecting people from catastrophes of nature in different physical environments
II. Making a Home	Building and living in homes in different environments
III. Conserving and Improving Material Conditions	Protecting plants and animals in different physical environments
IV. Coöperating in Social and Civic Action	Comparing social and civic life in different physical environments
V. Getting a Living	Getting a living in different physical environments from plants, animals and minerals Getting a living in different physical environments by manufacturing Getting a living in different physical environments by buying and selling
VI. Securing an Education	Comparing schools in different physical environments

VII. Expressing Religious Impulses	Comparing religious ceremonies and customs in different physical environments
VIII. Expressing Aesthetic Impulses	Comparing the arts in different physical environments
IX. Engaging in Recreation	Comparing recreation in different physical environments

GRADE V

Areas of Human Activity	Center of Emphasis *Influence of Travel, Adventure, and Advancing Physical Frontiers on Life.* (Life of children, adults, plants, and animals in our state, our nation, and other parts of the world through the ages)
	Problems of Life
I. Protecting Life and Health	Protecting life and health when traveling, exploring, and living in frontier communities
II. Making a Home	Building and living in homes in frontier communities
III. Conserving and Improving Material Conditions	Breaking speed, distance, and endurance records Promoting expeditions of exploration and adventure, and using their results Finding how explorations and frontier life have affected plants and animals
IV. Coöperating in Social and Civic Action	Coöperating in social and governmental activities in frontier communities
V. Getting a Living	Getting a living in frontier communities
VI. Securing an Education	Securing an education in frontier communities
VII. Expressing Religious Impulses	Expressing religious impulses in frontier communities
VIII. Expressing Aesthetic Impulses	Finding how travel, adventure and frontier conditions have affected the arts and participation in aesthetic activities
IX. Engaging in Recreation	Traveling as recreation through the ages Engaging in recreation in frontier communities

GRADE VI

Areas of Human Activity	Center of Emphasis *Influence of Languages, Mathematics, Governments, and Social Institutions and Agencies on Life.* (Human life and physical conditions in our state, our nation, and other countries through the ages)
	Problems of Life
I. Protecting Life and Health	Establishing, financing, and using county and state health units

II. Making a Home	Using mathematics in providing food, shelter, and clothing Using language to enrich home life
III. Conserving and Improving Material Conditions	Finding how mathematics has been used to improve physical conditions Determining how governments have improved physical conditions
IV. Coöperating in Social and Civic Action	Finding how diverse languages have affected peace and war Using governments, social institutions, and other social agencies to improve social conditions
V. Getting a Living	Using mathematics and language in getting a living Finding how governments and social institutions and organizations have affected getting a living
VI. Securing an Education	Using language and mathematics as a means of gaining useful knowledge and insight Using schools through the ages as a means of education
VII. Expressing Religious Impulses	Expressing religious impulses under various forms of government
VIII. Expressing Aesthetic Impulses	Enjoying and creating beauty by means of the graphic arts and geometric designs Developing the arts
IX. Engaging in Recreation	Viewing the growth of governmental and social interest in recreational needs

GRADE VII

Areas of Human Activity	Center of Emphasis *Fitting Into and Using the Home, School, and Community.* (In our state, our nation, and other countries through the ages)
	Problems of Life
I. Protecting Life and Health	Building a strong body and caring for health Making the home, school, and community more healthful
II. Making a Home	Fitting into and improving the social life of the home Helping care for the home
III. Conserving and Improving Material Conditions	Conserving and developing the natural resources of the community
IV. Coöperating in Social and Civic Action	Participating in and improving community life
V. Getting a Living	Saving and using money
VI. Securing an Education	Using educational opportunities to the best advantage
VII. Expressing Religious Impulses	Fitting into the religious life of the community

VIII. Expressing Aesthetic Impulses	Relating art to everyday life
IX. Engaging in Recreation	Engaging in various forms of wholesome recreation in the home, school, and community

GRADE VIII

Areas of Human Activity	Center of Emphasis: *Adjusting Life to Scientific Inventions and Machine Production.* (In our state, our nation, and other countries through the ages)
	Problems of Life
I. Protecting Life and Health	Safeguarding life and health from the effects of scientific inventions and machines Safeguarding life and health by means of scientific inventions and machines
II. Making a Home	Adjusting the home to scientific inventions and to machine production
III. Conserving and Improving Material Conditions	Inventing and using machines Developing and using power
IV. Coöperating in Social and Civic Action	Relating government to the needs and problems of the machine age
V. Getting a Living	Adjusting economic life to the results of inventions and machine production
VI. Securing an Education	Using modern inventions in improving school attendance and school buildings, equipment, and instruction
VII. Expressing Religious Impulses	Adjusting moral and religious life to conditions in the machine age Using inventions in improving religious buildings, equipment, and services
VIII. Expressing Aesthetic Impulses	Adjusting to and using new forms and types of art suited to the machine age
IX. Engaging in Recreation	Adjusting to new forms and needs of recreation resulting from inventions and the machine age

GRADE IX

Areas of Human Activity	Center of Emphasis: *Using Science and Social and Governmental Agencies for the Welfare of the Public.* (In our state, our nation, and other countries through the ages)
	Problems of Life
I. Protecting Life and Health	Using scientific discoveries to improve health Coöperating with and using health agencies
II. Making a Home	Using science and governmental agencies to improve housing conditions Coöperating with and using agencies for the protection of children

III. Conserving and Improving Material Conditions	Using science and governmental agencies to improve transportation and communication Protecting life from catastrophes
IV. Coöperating in Social and Civic Action	Preventing and controlling crime Using government for the public welfare
V. Getting a Living	Using governmental agencies to regulate business and labor conditions
VI. Securing an Education	Extending educational opportunity to all
VII. Expressing Religious Impulses	Using and promoting various religious agencies
VIII. Expressing Aesthetic Impulses	Using and supporting agencies for the development of the fine arts
IX. Engaging in Recreation	Using social and governmental agencies to provide recreational opportunities

GRADE X

Areas of Human Activity	Center of Emphasis *Controlling and Improving Biological and Social Conditions.* (In our state, our nation, and other countries through the ages)
	Problems of Life
I. Protecting Life and Health	Preventing and controlling disease Promoting mental and emotional health Caring for the physically and mentally handicapped
II. Making a Home	Preparing for marriage and family relationships
III. Conserving and Improving Material Conditions	Encouraging and using scientific research in the interest of society as a whole Improving plant culture Improving animal culture
IV. Coöperating in Social and Civic Action	Participating in the rights and duties of a citizen Improving relations with minority race groups Developing a definite population policy
V. Getting a Living	Choosing a vocation wisely
VI. Securing an Education	Continuing education after graduation from high School
VII. Expressing Religious Impulses	Enlarging the function of the church to meet social needs
VIII. Expressing Aesthetic Impulses	Expressing and enjoying beauty through the various fine arts
IX. Engaging in Recreation	Improving health and social conditions through wholesome forms of recreation

GRADE XI

Areas of Human Activity	Center of Emphasis: *Controlling and Improving Physical, Economic, Social, and Business Conditions.* (In our state, our nation, and other countries through the ages) Problems of Life
I. Protecting Life and Health	Protecting the physical and mental health of industrial workers
II. Making a Home	Adjusting family spending to family income
III. Conserving and Improving Material Conditions	Conserving and developing the natural resources of the state, nation, and other nations Improving the physical environment through physical, biological, and chemical inventions
IV. Coöperating in Social and Civic Action	Coöperating with social agencies to improve economic and business conditions
V. Getting a Living	Improving the agricultural situation Producing goods Exchanging goods Consuming goods intelligently
VI. Securing an Education	Improving the administration and financing of schools
VII. Expressing Religious Impulses	Applying religion to personal, social, and business life
VIII. Expressing Aesthetic Impulses	Relating art to business
IX. Engaging in Recreation	Controlling and improving commercial amusements

GRADE XII

Areas of Human Activity	Center of Emphasis: *Understanding Major Scientific, Social, Economic, Business, and Governmental Movements and Trends.* (In our state, our nation, and other countries through the ages) Problems of Life
I. Protecting Life and Health	Developing an adequate medical service for larger numbers of people at a reasonable cost
II. Making a Home	Adjusting to trends and changes in the home
III. Conserving and Improving Material Conditions	Lessening the delay between invention, or discovery, and man's adaptation to it
IV. Coöperating in Social and Civic Action	Adjusting society to a changing civilization Improving international relationships

V. Getting a Living	Making our economic organization more efficient and more secure
VI. Securing an Education	Integrating educational agencies Changing the schools to meet the needs of a changing civilization Preserving freedom of thought in the schools
VII. Expressing Religious Impulses	Promoting religious tolerance and adjusting religion to social and scientific changes
VIII. Expressing Aesthetic Impulses	Evaluating trends in the fine arts Providing aesthetic enjoyment for larger numbers of people
IX. Engaging in Recreation	Providing recreational opportunities and facilities for larger numbers of people

THE WINNETKA ACADEMIC ANALYSIS CHART AND THE WINNETKA CHART FORM

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THE most crucial problem of a testing program is to translate test data into appropriate and significant teaching practice. Of course the effectiveness of that translation depends upon the understanding, wisdom, and ability of the teacher who is applying test information to the details of her daily work with children. No mechanical agency can do the translating. Nevertheless, the technique of presenting test data is of fundamental importance. It may determine both the extent to which, and the way in which, the test data are used. Hence we must attend closely to the mechanics or techniques used in reporting the findings of a testing program.

The Winnetka Academic Analysis Chart is a graphic device for presenting the results of intelligence, achievement and special ability tests to teachers. It shows the data clearly and impressively in a way that has meaning in terms of teaching procedure. The Winnetka Chart Form is an instrument designed to simplify the clerical work of preparing and plotting the test results on the chart. In this article[1] it is our purpose to explain the nature of the Winnetka Academic Analysis Chart and the Winnetka Chart Form, and to show ways in which they may be used to aid in converting raw test data into understanding and effective work with individual children.

When reporting the findings of a testing program, several things should be kept in mind: The teacher should be able to read and use the data with a minimum of clerical work and mathematical calculation. Data should be constantly at hand where she can refer to them quickly and easily whenever an appropriate question arises. It is important for information to be available in concise and compact form, and it should not be necessary to thumb through a mass of material in order to find any desired item. The relationships between any one test item and the many others which have a bearing upon its interpretation should be apparent without the rather futile effort of attempting to correlate a disconnected series of tables, graphs, lists and verbal reports that obscure important relationships by their very dispersedness. The information should always be current—up to date—not a picture of the situation at

[1] A more detailed explanation is published in the form of a manual by the Winnetka Educational Press, Horace Mann, School, Winnetka, Illinois.

a more or less distant past. Finally, the data should give the teacher a clear picture of the direction or trend of the child's growth so that she can judge where he is going if present treatment and environmental conditions remain as they are, or, on the other hand, she should be able to see concrete evidence of the results of a change of program such as remedial work or a profound change in home conditions or other environmental factors.

During five years of use in the Winnetka Public Schools, the Winnetka Academic Analysis Chart has proved its effectiveness in meeting these demands. In schools with an average annual enrollment of some fifteen or sixteen hundred children in the eight elementary grades, the chart has reflected the growth of each individual child. As these pictures have grown from year to year, they have provided a wealth of experience in interpretation that has grown more and more helpful.

The principles upon which the chart is built are simple. It gives a graphic time analysis in which the chronological age (hereafter referred to as C.A.), the mental age (M.A.), the academic growth, and the development of special abilities are all plotted together within the same cross-section surface in accordance with time and development scales which are comparable. Hence it gives a graphic picture of the interrelationships between C.A., M.A., etc., as they change from time to time in the course of the child's growth.

Figure I shows a chart which is blank except for two diagonals which are drawn in with ink. We shall refer to them presently. First, notice the C.A. scale across the top and the M.A. scale in the right margin. The cross-section body of the chart is divided into yearly intervals each way by heavy lines, and subdivided into half-yearly intervals by the light lines. A row of small dots and short vertical lines that runs just above the C.A. scale serves to subdivide that scale into monthly intervals. On the actual chart a series of red rectangles are superimposed upon this row of small dots and lines to block in the ten months of each school year. Since these red blocks photograph black so that the small perpendicular lines and the dots will not show through, these month divisions have been sketched in ink below the red blocks. Within the gap which separates each pair of blocks appear the small line and dot (or the small dot and line, as the case may be) which represent the two summer months of July and August. Above these gaps, the appropriate year dates are written in to fit the age of the child. The dot which is placed above the center of each block marks the position of the month of January for

each year. When the year dates are filled in, this provides a calendar from which one may read any one of these three things: the age of the child in years and months, the date in years and months, and the portion or tenth of the school year. When data are plotted according to any one or all of these time measures, they may be read in terms of any one or all of the three. The relationships between them are seen at a glance when one is familiar with this calendar part of the chart.

The M.A. scale is not subdivided into months. For all practical purposes, readings to the month of M.A., or to the tenth of a school year, may be made accurately enough by inspection.

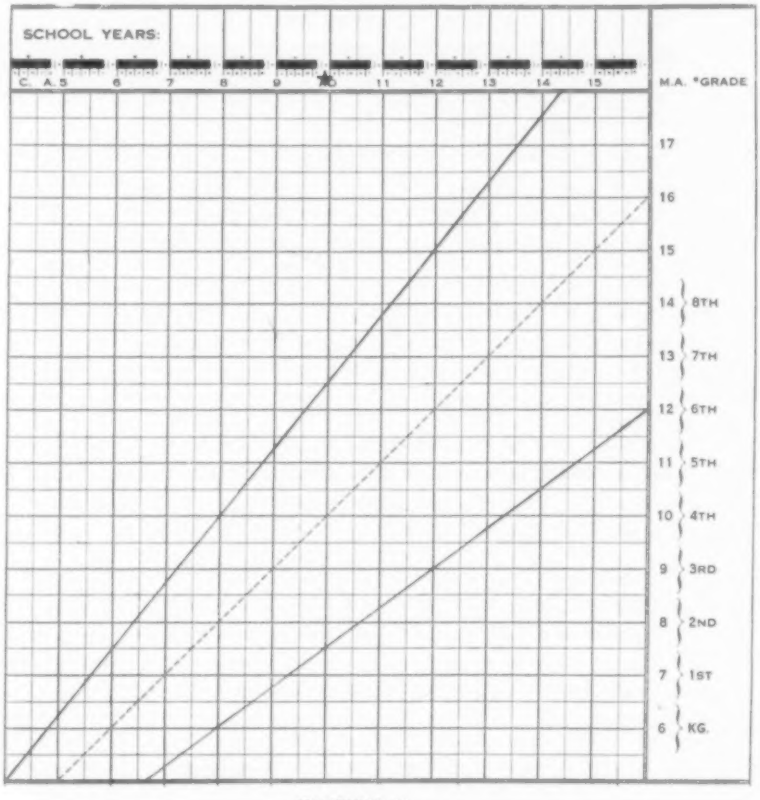

FIGURE I

From the lower left corner of the chart to the upper right, a printed diagonal (Broken line - - - - -) is shown. This diagonal represents an I.Q.

of 100. That is, it represents a ratio of one-to-one between C.A. and M.A. Drop a perpendicular from any month of age on the C.A. scale to intersect this diagonal, and then follow a horizontal from the point of intersection to the M.A. scale at the right. The horizontal will show an M.A. which is the same as the C.A. represented by the perpendicular. Now notice the ink-drawn diagonal which falls above the printed diagonal. This and the following ink-drawn diagonals are samples of those drawn (one on each chart) to represent the I.Q. of a particular child. The printed (broken line) diagonal, or 100 I.Q. line is on all charts as a line of reference. This higher ink-drawn diagonal represents an I.Q. of 125, a ratio of 1-to-1¼ between C.A. and M.A. Perpendicular and horizontal lines (real or imaginary) which intersect at any point on this diagonal will always show a M.A. which is one-fourth greater than the C.A. The lower ink-drawn diagonal represents an I.Q. of 75. It includes all points on the face of the chart where the M.A. is just three-fourths of the C.A. Similar diagonals may be drawn to represent any desired I.Q. This arrangement serves two important purposes: First, it enables the teacher to read off the M.A. of a child for any C.A. (for any date, or for any tenth of any school year) when the I.Q. is known. Hence, she may know the M.A. at present; she may read off the M.A. for a future date; or she may reverse this procedure and reading backward from the M.A. scale to the I.Q. diagonal and thence to the calendar at the top, she may know when the child will reach a desired M.A. (or age of readiness so far as that is indicated by M.A.) In the second place, the slant of the I.Q. diagonal—the steepness with which it rises—shows the rate at which the child is maturing mentally as compared with the rate of the average child as indicated by the printed diagonal. A study of a large number of charts, representing children with many different I.Q.'s soon gives the impression of a continuous variable. Children are not classified into groups according to I.Q. levels, and labeled.[2]

The extent to which such readings, from any one diagonal, may be carried is limited, of course, to the span of years over which the mental test measurement is expected to be valid. A single test cannot be accepted

[2] On the lower left corner of the chart, space is provided for recording the tests given. In the "Maturing Rate" column, it is true, we indicate the I.Q.'s by levels as "very slow," "slow," "rather slow," "average," "rather rapid," "rapid," and "very rapid." These terms, however, do not overcome the very definite impression given by the diagonals on the chart, the impression that rate of mental growth is relative, that any specific rate falls within the range of a continuous variable, and that even extremely divergent rates do not mark a child as different in kind but only in degree.

as valid throughout the age range of the elementary grades without supplementary evidence. Check tests should be given at reasonable intervals. If the results of such tests corroborate the findings of the first test, the diagonal may be retained. If not, the old diagonal may be erased or ignored and a new one drawn. For practical purposes, it is necessary to select one measure as the "best" and to use it primarily. Discrepancies in intelligence test results are doubtless meaningful, but their meaning is often far from clear. Diverging measures may be noted as secondary data that may throw some light on the case at hand, but attempts to employ several diagonals for the purpose of analysis prove to be confusing rather than helpful.

If several different tests are in use, the diagonals which represent them may be distinguished by drawing them with colored pencils so that red stands for a Stanford Binet, orange for a Kuhlman Binet, blue for a group test, etc. Performance test results and tests of special abilities where the scores are in terms of age or rate of growth may be represented by similar diagonals.

When we plot achievement test results, we use the M.A. scale as though it were an educational age scale. Hence the educational age found on any battery of tests, or the subject age found on a test in any one subject, may be plotted against the scale in the right margin. Notice that a grade scale is bracketed along this educational age scale. According to the brackets, a child is expected to be in first grade while his educational age ranges from six years and six months up to seven years and six months. Each grade bracket encloses one year of age. Of course, such a regular age-grade scale of equivalents has been artificially smoothed. We have found that these equivalents fit a large range of achievement test norms as closely as any one scale could. These norms were based upon a survey intelligence testing program in the Winnetka Schools from which it was found that the averages of mental ages and chronological ages for the children at the various grade levels fell very close to the grade standards shown.

Comparing the age-grade equivalents of various standard tests, one's attention is drawn to the striking inconsistencies in the norms. Various tests show widely differing age equivalents for each grade level. Further, one grade level may be given age equivalents ranging over as many as sixteen or even seventeen months while another grade level is equated with only ten months of age. Such variations must be kept in mind in plotting and reading results. We have made a practice of plotting grade

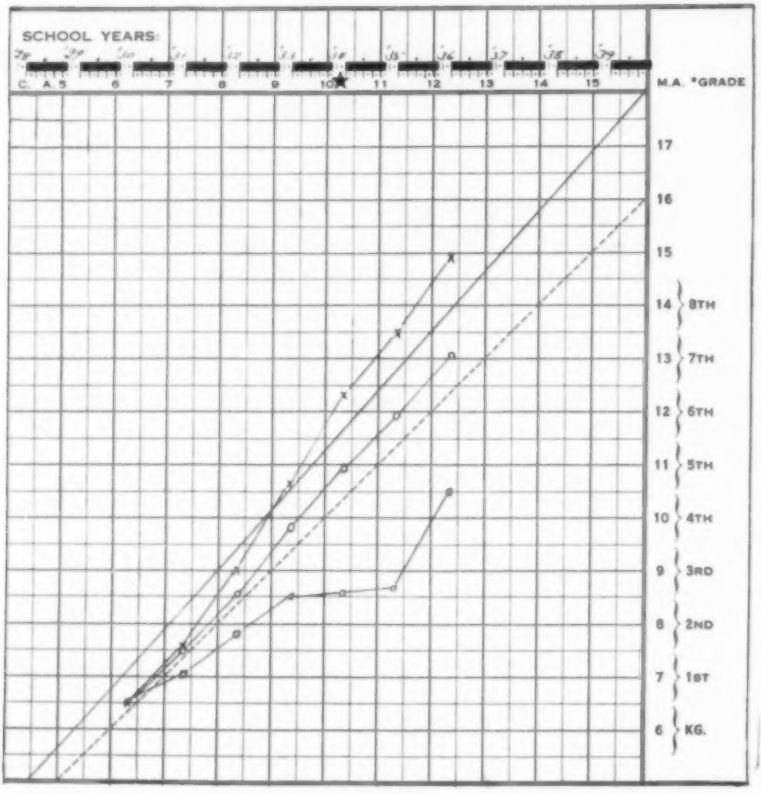

FIGURE II

standards only. Differences in age equivalents are then considered as but one of the several factors which characterize each peculiar test. It is true that, on this basis, comparisons between grade scores on different tests are a bit crude, but for purposes of guiding the teaching program, further refinement is spurious.

Achievement tests should be given at frequent intervals. In plotting them, we do not assume that any one test gives us a rate of academic growth. Instead, the score on each test is plotted at a fixed point and is represented by a symbol. For instance, "x" may always stand for a score on an achievement test in reading, "□" for an achievement test in arithmetic, "△" for social science, and "O" for general educational age, i.e., the median grade score on a battery of tests. To distinguish between scores on several different reading tests, the "x's" may be

plotted in different colors or the initial of the test may be used as a plotting symbol, as "G" for Gray Oral, "S" for Stanford, etc. Hence each test in a series of annual reading tests may be represented by a symbol placed appropriately under the calendar at the top and to the left of the grade scale. Each pair of "x's" may then be connected by drawing a short line between them. This forms a broken diagonal, and the slant of that diagonal indicates the rate at which the child's reading ability is growing. This rate may be compared directly with the rate of growth in C.A. and M.A., and in other subjects.

In Figure II, the chart for Paul M., we have shown three series of achievement test plottings. Notice that all three start from one point of origin at the lower left corner of the chart. That point does not represent any achievement test. It falls under September of 1930 when Paul was six years and four months of age, and it falls to the left of six years and six months of educational age, or at the beginning of first grade. It represents the zero point when Paul entered the elementary school. Following that point, each series represents achievement tests given annually in September. The "x" series rises rapidly until it reaches approximately a year above the I.Q. diagonal which represents the rate of mental growth, in spite of the fact that the I.Q. diagonal shows a rate of mental growth that is considerably above that of the average child. In other words, this child shows exceptional ability in reading. The "O" series of plots represent the median score on a battery of achievement tests each year. Notice that it falls about half way between the child's I.Q. diagonal and the printed diagonal throughout. We may consider the printed diagonal as representing the *chronological*[3] age of the child. This series then shows achievement that falls about half way between C.A. and M.A. each year. The "□" series of arithmetic tests tells a different story. In this field Paul had a slow start that developed into a remedial situation where he progressed very little over a period of two years. During the last year that is plotted, however, he has overcome his serious difficulties and is progressing rapidly toward normal achievement.

We now have the rate of growth as indicated by the chronological

[3] This printed diagonal is used only as a line of reference. If a perpendicular line is dropped from the C.A. calendar to cross this diagonal, the point at which it crosses will represent the mental age of the child only when his I.Q. is 100. If his I.Q. is above or below 100, the child's mental age will be represented by the point where that perpendicular crosses the I.Q. diagonal. The difference between the C.A. and the M.A. is represented by the length of that segment of the perpendicular which lies between the two diagonals. Hence we speak of the printed diagonal as the C.A. diagonal.

age shown by the printed or C.A. diagonal, the rate of mental growth shown comparatively by the I.Q. diagonal, and the rate of academic growth shown by joining several series of symbols with short lines. How are we to judge the relationships between them? If we expect a child to enter school during his sixth year and to progress at the rate of one grade of work each year, we will expect the achievement plottings to lie close to and to parallel the C.A. diagonal. If we base our standard of expected achievement upon mental age, we will expect the achievement plottings to fall near to and to parallel the I.Q. diagonal. More practical than either of these is to base our standard of expected achievement upon both C.A. and M.A. If we weight each equally, we will expect the achievement plottings to fall about half way between the C.A. and the I.Q. diagonals. Other possibilities may be suggested, such as weighting the C.A. by using the formula 2 C.A. vs. M.A. Then the achievement plottings should fall one-third of the way from the C.A. to the I.Q. diagonal. Whatever standard is chosen, the relationship between the actual achievement of a child and the achievement expected of a child of his age and mental maturity may be shown graphically. We have chosen the average of M.A. and C.A. as the proper standard of achievement to be expected. A study of the validity of that standard will appear soon.

Thus we have shown the general nature of the chart. Several of the most essential factors in a child's academic development may be shown for his whole elementary school experience. Many complex patterns develop, each the graphic picture of the academic side of a child's personality. All of the factors which are subject to measurement by standard tests may be represented.

Such information, of course, does not tell the whole story of a child's personality. His social adjustment, emotional stability, study habits, and physical development are important factors that are not subject to graphic presentation. When using the chart, it is necessary to keep these factors in mind. We must not set a mechanical standard upon one-sided information, and then judge the success or failure of the child, or of the teacher, on the basis of that alone. The charts are most useful when they form basic information in a clinical study. The less tangible variables of personality can be fitted into the picture most effectively on a discussion basis.

We are sometimes warned against too literalistic an interpretation of test scores. The fact that they are so easily subject to mathematical

manipulation and to concrete graphic expression sometimes leads to overemphasis which drives other important considerations from mind. I know of no more effective antidote to such an academic evaluation than to attempt, year after year, to fit the results of standardized tests into an understanding of individual children in the classroom. It does not take a teacher long to discover that intelligence and achievement tests do not tell her all that she needs to know about her children.

On the other hand, these tests give us invaluable aid in understanding. The correlation of intelligence test measurements with the actual abilities of the children may be far closer than a correlation co-efficient between M.A. and achievement test scores indicates. The bright child who fails to achieve according to his ability, the dull child who seems to master the early curriculum surprisingly well only to fall down in comprehension later, the child with a specific remedial handicap or physical or emotional difficulties; these may lower a correlation co-efficient sadly. None the less, the intelligence test helps us to recognize them for what they are, and we can direct our corrective measures far more intelligently with its help. With the measurable factors clearly presented in a concrete and unified form, we can fill in, and estimate the influence of, other factors with greater assurance.

The Winnetka Chart Form is a brass plate about 10¼″ by 12¼″ in size. A degree scale is etched upon it to help in drawing the M.A. lines. The chart can be fitted to the form so that a diagonal to represent any desired I.Q. may be drawn simply by placing a ruler in the appropriate position on the scale. It makes the plottings of the I.Q. diagonals on the charts very quick, easy, and accurate. In addition, there are three nomographic scales etched on the face of the Chart Form. These scales are similar to slide rule scales, but, instead of sliding two parts of a rule together, we have three scales. On the first nomograph, one scale represents the C.A., one the M.A., and the third the I.Q. If any two of these factors are known, the third may be found by placing a ruler in line with the two known factors and reading off the third where the ruler crosses the third scale. First, when an intelligence test is given, we know the C.A. and the M.A. We can read the I.Q. from the nomograph. Second, if we want to know the M.A. of a child at a later date, when we have the I.Q. and the C.A., the M.A. may be read. In the third case, we may want to know at what time, or what age, a child will reach a given

M.A. Here we know the I.Q. and the M.A., and the C.A. may be read from the nomograph. A second nomograph for C.A., educational age, and educational quotient, and a third nomograph for achievement grade, standard or expected achievement, and educational index are also provided. The degree scale for drawing the M.A. diagonals and the nomographs save a great deal of clerical work for any one who is dealing with large numbers of tests. Together, the Winnetka Academic Analysis Chart and the Winnetka Chart Form provide a means of test reporting that is at once effective and economical.

EDITORIALS

EDUCATIONAL OBJECTIVES

Among the many activities in the field of education currently pursued few are more important than the movement to reorientate the educative process with reference to the purposes of education. Literally hundreds of teachers and other school officials are today engaged in the process of redefining the purposes of education and in reconstructing the curricular offerings of the school to conform to these new points of reference. Over sixteen hundred courses of study, course outlines, and units of work were received by the United States Office of Education in response to a recent request for materials in this field.[1] Important as this movement is it is not our purpose, here, however, to further emphasize its importance but rather to direct attention to needed research in the determination of the purposes of education.

The goals set by education are of great practical and professional concern. A survey of the 1660 courses referred to above would seem to indicate that the most common source of educational objectives employed in these courses of study is some sort of concensus of opinion. Naturally one wonders how reliable these opinions are and how expert the assistance. The matter is after all quite important. Many questions occur: Are the opinions sampled those of competent persons? Are the opinions sampled representative of those that should be sampled or are they merely the opinions of special groups,—possibly pressure groups, those with special interests to defend or possibly the opinions of individuals? To what extent do they represent the careful study of social and individual needs? To what extent do they represent the real needs of children and adults and not pseudo needs or superficialities? Are they validated needs or are they merely the whims and fancies of a few persons here and there colored by temporary ideology, current misconceptions, and half truths? It is easy to be mistaken. There are many other questions of this sort that one would like to ask.

[1] Leary, Bernice E. A Survey of Courses of Study and other Curricular Materials Published since 1934, Bulletin, 1937, No. 31 (Washington: United States Department of Interior, Office of Education, 1938), 185 pp.

A survey of the researches pertaining to curriculum construction would seem to indicate that all in all some ten different methods have been employed in attempting to discover and validate the purposes of education[2]: 1) biological studies of the nature and needs of man; 2) historical studies of social trends and institutions; 3) psychological studies of the nature, needs, and capacities of children; 4) activity analyses of child and adult life; 5) occupational analyses of adult life; 6) studies of the errors, shortcomings, and difficulties of persons under different conditions and at different age levels; 7) studies of the kinds of subject matter found useful in everyday life; 8) studies of successful and unsuccessful individuals, communities and institutions; 9) analyses of school subjects; and 10) concensus of expert opinion already referred to above. How valid are these several methods commonly employed in determining the objectives of education? Are some of these methods better than others? What are the assumptions underlying each and the criteria by which one might choose from among them? Then again to what extent are current formulations of the purposes of education merely someone's guesses about the matter and to what extent are they based upon systematic investigation?

Closely associated with the problem of determining the objectives of education is that of the form in which they are to be stated. The form of statement will determine to some extent the nature of the research needed and the methods of research to be employed. Objectives are sometimes stated in terms of subject matter to be learned, activities in which pupils are to participate, desirable forms of pupil behavior, abilities to be attained, desirable traits of character and personality, and such psychological abstractions as knowledges, skills, attitudes, ideals, appreciations, and interests. Many authors seem confused in their formulations of objectives. It is not at all uncommon to find objectives of a very diverse character thrown together into the same or related categories. Objectives stated in terms of subject matter to be learned or activities to be performed would appear to represent confusions of educational means and ends,—curriculums and objectives; objectives stated in terms of traits make important psychological assumptions that may or may not be true as many competent psychologists have already pointed out; objectives stated in terms of such psychological abstractions as knowl-

[2] Barr, A. S., Burton, William H., and Brueckner, Leo J. *Supervision: Principles and Practices in the Improvement of Instruction* (D. Appleton-Century Company, 1938), pp. 159-222.

edges, skills, attitudes, ideals, appreciations, and interests make important assumptions about the relation of the whole and its parts; objectives stated in terms of desirable forms of behavior frequently mix general and specific forms of behavior. It is doubtful if any particular sort of behavior can always be characterized as correct or even desirable; it may not be appropriate for the particular situation at hand however desirable it may be for other times, persons, and conditions. Much research has already been done with reference to certain aspects of this problem but more needs to be done and the whole field systematized as an aid to further research with reference to the purposes of education.

Only a few of the areas in which research is needed can be indicated here. Researches need to be made with reference to the attainability of objectives. Then too some objectives will need to be determined ahead of time and some on the spot by the teacher. The fact that some objectives are to be determined on the spot by the teacher does not mean that the approach needs to be any less scientific. As yet no very satisfactory formula seems to have been devised for ironing out the conflicts in adult values and those of children and in harmonizing the interests and needs of the individual and society. There are many other problems of this order.

The purpose of this editorial has been to call attention to an important field of research and of needed researches growing out of the attempt to reorient the educative process with reference to the purposes of education. The skill with which this work is done is of great practical concern to lay and professional workers alike. The comments here offered are in no respect a reflection upon the excellent work that has already been done in this field but a plea for caution and careful workmanship. The responsibility is after all one of considerable importance.

A. S. Barr

GETTING KNOWLEDGE VERSUS LEARNING FACTS

Knowledge of a body of facts includes the ability to explain their relations in a way to show that each fact adds to the understanding, and also to the conclusions to be drawn about their connections for use with old and for new studies. The experiences of a mature mind are needed to acquire this full knowledge of a complex body of facts.

The problems of learning for pupils in each successive grade of the elementary schools involve their experiences and their growing maturity

as well as mental aptitudes for the knowledge to be acquired in each school grade. This means that the knowledge which each pupil may acquire at a given mental age depends upon the number of facts of a particular lesson that needs to be considered together in order to give an experience of knowledge. There are also certain recognized types of learning which may be adapted to a lesson in a way to aid learners whose range of experiences and whose learning abilities are known. When such facts about the range of the learning abilities of the pupils in each school grade are more definitely determined and the adjustment of the needed study materials and of teaching methods made, then the attainment of pupils in each grade may be measured in terms of knowledge instead of merely recording the number of facts retained in memory. In this way the pupils will get something more than just "chips of knowledge," if there be such things with any life in them.

For example: A ten-year old girl in the fourth grade, whose mental age was ten years and five months, subtracted as follows—372 from 436 gave her 144 as the answer, and she was sure this was right. In each subtraction she took the smaller digit from the larger one. From the knowledge she had gained of our number system, why was not 144 the true difference between these three sets of digits? Her understanding was knowledge to her. The trouble is in the teaching situation in her previous year. Numbers had been taught to her much in the same way as was the teaching of reading a hundred years ago with its—ab-ab; ba-ba; etc. That is, the meaning for size was neglected for a habit of just counting and recognizing position as a means of counting beyond nine. The number 9 was just a peculiar symbol for the ninth digit. Without the clear recognition of size for each of the two numbers 372 and 436 there is no clear meaning for 64 as the difference. It is accepted as the result of using the rules for subtracting. But if the number system was so understood as a language of size and the size, 436, was recognized as 3 hundreds, 13 tens, and 6 units then the subtraction example would be:

3(1)36 minuend
3 72 subtrahend
64 remainder = size of the difference.

In the example 3006 — 308 the difference becomes 299 (16) — 308 equals 2698 size.

It may be that this last example cannot be thought of in a way to be knowledge before the fifth or sixth grade.

AN OBSERVER

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

BROOKS, FOWLER D., and SHAFFER, LAURANCE F. *Child Psychology* (Boston: Houghton Mifflin Company, 1937), pp. xxx + 600. $3.00.

The writing of child psychologies proceeds apace, and correspondingly the obligation of the reviewers to present an informative and critical appraisal is increased. The prospective reader should be informed of the scope of the work, the critical inclusion and evaluation of content, the meaningful organization of materials, and the adaptability of the work to the varying needs of students. Transcending all in importance is the question whether the author has made any contribution which would justify the publication and the adoption of another text.

The omnibus character of the topics treated and the contents included by Brooks and Shaffer in their book should make it readily adaptable to the curricular needs of diverse colleges and universities, and to any instructional point of view in the teaching of child psychology. The simplicity and clarity of the style is achieved legitimately and not through surrender to a cheap popularization. The teachability of the work through a wide range of ability and background of students in an introductory course in child psychology has been demonstrated in the reviewer's classes.

The organization of the text is of the topical type with a genetic approach within each field. The prenatal and neonatal periods of development receive special consideration and therefore constitute cross-sectional exceptions to the general topical organization. Therefore, so far as organization is concerned, the present text follows the conventional pattern of most of the recent child psychologies. The only innovation discerned by the reviewer is pedagogical in nature: each chapter or important section begins by raising the principal questions which need to be answered. This contributes to the orientation of the student in regard to the problems of development and tends to integrate the textual material subsequently read. The reviewer believes that questions thus conceived and placed in a textbook have a real utility as contrasted with the usual type of questions introduced at the end of chapters.

From the standpoint of developmental psychology the most important inclusion of content, as compared with other child psychologies is the effective recognition that there can be no satisfactory insight into the child except in terms of a history of development from the beginning of the individual rather than from birth. The origins of child behavior have been dismissed too casually by most writers.

The special attention given to "children's religion," while savoring of an emphasis of child psychologies of the past, will doubtless appeal to those institutions having a religious rather than a purely secular viewpoint, and the treatment accorded the subject may well prove a liberalizing and enlightening influence.

The omnibus character of the work is further illustrated by the fact that it does

not treat solely of developmental psychology but endeavors to appeal to parents and to teachers by offering much in the way of an applied psychology of childhood.

Of the traditional topics treated in texts in this field there are a number of the present work which have special merit: the chapter on the problems and methods of child psychology is remarkably well designed for the type of student enrolling in a course in child psychology; the chapter by Garvey on the principles of learning is especially provocative for the student of educational psychology; and the chapter on the growth of intelligence is exceptional in its discrimination between curves based upon M.A.'s and true growth curves. This is indeed a salutary correction of a misconception entertained widely by those with superficial understanding of mental tests. Likewise helpful, in clarifiying the issues of the at present much publicized notion that "intelligence" is appreciably modified by the type of environment afforded the child, is the following:

"Probably we should add that even if all the studies showed environment having an important influence upon I.Q., we still would not know whether it really does speed up the tempo of mental development or merely helps the child do better on the present types of intelligence tests by giving him certain information and skills" (p. 274).

In general the coverage of the text is quite comprehensive for an introductory course. The references are excellent. And, on the whole, they have been critically evaluated although the aim has been to write a text and not a mere compendium of those experimental researches which may be rigidly subjected to the statistical criteria of reliability.

There are errors of omission such as the failure to mention the work of the Fels Foundation for the study of prenatal and post natal development in the following account of research upon fetal development:

"The data on the development of the human fetus include a number of sporadic observations by several physicians, and two organized programs of research, those of Minkowski, in Switzerland and Hooker in America" (p. 42).

There are numerous misstatements and ambiguities which may be illustrated by the following examples:

"On the basis of the various combinations of man's twenty-four pairs of genes along, there are 282, 429, 536, 481 possible kinds of human individuals" (p. 29—Do the authors mean *genes* or *chromosomes?*).

"The mechanisms involved are ready to function at birth" (p. 331—This refers to *thirst* but no supporting evidence is cited).

"The newborn infant is neither a social nor an unsocial being . . . Although the infant is non social at birth, he cannot remain so for a very long time" (p. 359—The distinction between *unsocial* and *nonsocial* needs to be made explicit for the average student).

"Visual impressions are received upon the retina . . . Auditory impressions are received in the ear" (p. 191—*Impressions* is not present-day usage. See Warren's "Dictionary").

"Merely thinking about food may start off the flow of saliva which *originally* was activated by the sight or smell of food" (p. 337—Italics mine).

The placing of foot-note 16 in the text on p. 87 gives Pratt, Nelson and Sun credit for observations on the sucking response which were actually made by Jensen.

"Responses to pressure and to temperature also appear before birth" (p. 44—"Birth" should be qualified since no one has demonstrated responses to thermal stimuli *in utero*).

"Behavior development, in general, shows evidence of the cephalo-caudal sequence. The first responses in all animals are elicited in the *upper* region of the body, and progress *downward*" (p. 44—Italics mine. The authors err in assuming that *upper-downward* is synonymous with *cephalo-caudal*).

"Thoughts, ideas, memories, and other mental processes may modify bodily processes by innervating the autonomic division" (p. 279—Does this mean that the authors embrace interactionism as a systematic position, or is this merely an oversight in phrasing?).

There are likewise errors in interpretation and emphasis such as these:

"When the sole of an infant's foot is stroked lightly along the median line from toes to heel, we often observe an extension or spreading of the toes, known as the *plantar reaction*" (p. 87—The writers also term flexion of the toes a "negative Babinski." These are not standard usages. Any response regardless of character is called a plantar response if elicited by stimulation of that area. The term 'Babinski' applies to one type only of the plantar response).

In relation to Stubb's researches upon the effect of continuous auditory stimuli upon the neonate the authors report that increasing the duration and intensity of the auditory stimulus produces greater response consists in the *inhibition* of activity or movement. In short, they do not distinguish between the results of continuous and discontinuous stimulation.

More serious than the errors just cited, in the estimation of the reviewer, is the complacent assumption that adjustment in the social milieu is the *sine qua non* of educational endeavor. Particularly when the impresison prevails that adjustment means establishing a high degree of conformity! Despite the expressed recognition of the cultural origin of morals, the coupling of "Children's character" with "children's religion" in a single chapter almost inevitably leads to an unwarranted and unfortunate implication. Further, the apologetic attitude assumed is a high gloss over some of the most vicious aspects of institutional religion.

The principal regret appears to arise in reference to the use of methods and materials of religious education which demonstrate their inappropriateness by their inefficiency! Likewise there seems to be a tendency to re-define religion in terms of a personal viewpoint or ideal rather than to represent it in terms of actual practices. The apologetic viewpoint of the authors is well expressed in the following:

"We conceive of religion, not as a useless tool of the strong or the refuge of the weak, nor yet as an intellectually disreputable emotional fervor, as some seem to do. We have tried to show, by discussion and reference to the literature on the subject, that true religion is an integrating force in the lives of people to whose mental advance and health it can contribute much.

"The central core of religious experience is worship. Music, ritual, and other important elements of worship do, under favorable circumstances, contribute much to personal integration. Joy, praise, prayer, confession, and sublimation can have distinct values for the child's mental health. The more effective use of these means is desirable in many churches. The feeling of security which religion can give the child is noteworthy" (p. 508).

To all of which one may well retort that, call it what one will, such an integration smacks of an opiate administered to helpless children.

In summary, it may be said that this text in child psychology will meet with general approval. It contains a wealth of materials from which one may select to build either a course treating primarily of child development or one devoted principally to the guidance and control of children. It is a text which though simply written evokes the respectful attention of the student. In short, it meets a variety of needs and points of view.

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CROW, CHARLES SUMNER. *Creative Education: Some Relations of Education and Civilization* (New York: Prentice-Hall, Inc., 1937), pp. xxvi + 456. $3.00.

This text describes a type of education which, in the author's opinion, may en-

able us to come out ahead in our long, drawn out race with catastrophe. ''—Until a civilization arises, the main concern of whose geniuses shall be the creative education of all its citizens and especially of its children,'' (p. 8) there is little hope. Crow does not give an explicit definition of creative education or creative learning but he makes it very clear that his ideals are being fairly well approximated in some of our best progressive schools, both public and private. Creative education involves large, meaningful units of experience, where, as in life, ''the whole individual confronts his environment with the urge to live.'' (p. 4).

The body of the text is divided into four parts. Part One—''Creativeness in Life and in Education'' (Chapters II, III, and IV) restates Dewey's contention that education is life and emphasizes the potentially creative nature of life. Part Two (Chapters V through XII) describes the following eight cycles of experience in creative learning:

Exploring possibilities and setting up objectives; devising ways and means; organizing and working together; finding and defining problems; searching eagerly for what is needed; practicing constructive criticism; raising the unit activity to the level of creative achievement; a unique social service.

Part III ''Problems of Creative Teaching'' (Chapters XIII through XVII), describes the teacher's responsibilities for the various temporal and psychological phases of the creative learning processes. Part IV, ''Creative Education and Western Civilization,'' is a statement of the author's conviction that our age can be saved by the ''Progressive'' movement.

Crow is at his best as an inspirer. His style is evangelical. He has a message—a challenge—and he presents it enthusiastically and without the drag of those inhibitions which would serve to temper the exuberance of a more scientific educator. Words such as evaluation, testing, measurement, and appraisal do not even appear in the index. Whether Crow is beyond such earthly considerations or has not yet reached them the reviewer hesitates to say. The text contains no tables, graphs, or statistical materials of any sort. While very few references are made to the research journals, many of the chapters are followed by extensive lists of more or less popular books recommended for further reading. There is no selection of chapters or pages in these references, nor any indication of certain books out of a total of twenty or thirty listed which would be most worthy of intensive study.

''Creative Education'' might well be recommended to those whose faith in the New Education has grown weak. It is in no sense a dispassionate, disinterested discussion of the classroom implications of an educational philosophy. Such, I suspect, was not the intention of the author.

STEPHEN M. COREY
University of Wisconsin

GILLSON, MARGERY STEWART. ***Developing a High School Chemistry Course Adapted to the Differentiated Needs of Boys and Girls.*** Contributions to Education, No. 709 (New York: Bureau of Publications, Teachers College, Columbia University, 1937), pp. vii + 95. $1.60.

A list of 100 ''objectives'' to be achieved in teaching chemistry was sent to several hundred people with the request that they mark with a 1 such as have been ''of greatest value to you'' ''in connection with what you do or what you read.'' Mark 2 if of great value . . . 5 if of no value. Or if you ''feel unable to rank these items, will you please check the

ones that you feel would be useful or interesting to you.''

The list sent to the general group consists of 15 principles like ''The volume of a gas varies with the absolute temperature''; 16 generalized facts, like ''matter occupies space and has weight''; 66 items of knowledge like ''knowledge of how soap is made'' and 3 habits conducive to good scientific thinking like ''the habit of basing conclusions on data not opinion or prejudice.''

There were 656 lists returned, 32 from men and 73 from women designated ''checkers'' who had not studied chemistry. The others presumably had done so either in high school, college or in both.

The main conclusions follow: (1) While there are ''some phases of chemistry more useful to women than to men, and vice versa, there is still a larger body of subject matter which is useful alike to men and to women.'' (Tables give the valuable data) (2) ''A large amount of the chemistry which is taught in high school does not function in the lives of the pupils.'' More tables (3) These ''adults are aware of the value of attacking problems in a scientific fashion.'' Indeed the habits essential to good thinking are given first rank, ahead of principles or other items of chemistry. (4) The fundamental principles of chemistry receive greater stress than factual materials. In her conclusion number 7 she states that ''the oxidation-reduction principles and the periodic classification of the elements receive low values'' (from her data). One would expect therefore that they should not be retained in the course. But they ''are so essential to an understanding of the subject that they must be included.'' Which is certainly a violation of her statement that conclusions should be based on data, not opinion.

This is not the only instance of the disregard of the safeguards of good thinking. On page 1 she says ''The introduction of general science . . . has not created a desire for more science'' as ''is shown by the fact that in 1915, 21.6 percent of the high school population was enrolled in physical science classes and in 1928 the enrollment had dropped to 14 percent.'' She does not consider all possible hypotheses. If the high school population is subdivided among an increased number of subjects (and there was such an increase during 1915-1928) the percentage enrolled in each old subject is fairly sure to decrease.

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WALKE, NELSON SUMTER. *Traits Characteristic of Men Majoring in Physical Education at the Pennsylvania State College.* Contributions to Education No. 735 (New York: Bureau of Publications, Teachers College, Columbia University, 1937), pp. vii + 162. $1.60.

An introduction concerned with the shifting emphases in education, the need of leadership with new vision, the trends in present practice in teacher training institutions, a survey of literature dealing with traits related to teaching success and traits of physical education majors, precedes the setting up of the procedures for the study. The author announced the purpose of the study to be ''to find out the characteristic traits of physical education majors, and to ascertain whether the traits possessed by this group are similar to those found among majors in Education and other groups, in order that educators may direct into the teaching field those students who exhibit the qualities essential to this profession and discourage those whose success seems doubtful.''

In selecting traits to be used, intelligence, school grades, use of English, socio-economic background, physical traits,

leadership, personality and vocational interest were the criteria used. The following tests were employed: De Camp Intelligence Test, Bernreuter's Personality Inventory, Sim's Score Card for Socio-Economic Status (Form C), Strong's Vocational Interest Blank, and Walke's Vocational Interest Query. Three groups of Pennsylvania State College Students—one composed of 145 men majoring in physical education; a group of 150 students selected at random from the School of Education; and a third group of 160 students from departments preparing students for vocations other than teaching—participated in the study. Because the particular aim of the study was to determine what constitutes teaching success in physical education, the author chose two groups of 25 students each from the 145 physical education students which he labeled the Success and Non-Success Groups according to the ratings given by three experts in predictions of teaching success.

After tabulating the results of the five tests, the scholastic records and the medical examination data for the three groups, the author made the following observations:

1. The Physical Education group showed marked inferiority to the Education and General Education Groups in intelligence, with the Success Groups of the Physical Education Students measuring favorably with the latter two groups.

2. The scholastic records of the Physical Education Group were far below those of the other two groups, but the Success Group again compared favorably with the other two groups.

3. Members of the Physical Education Group entered the University 10-11 months older than men of the other groups. While there was practically no difference in height, the members of the Physical Education Group were 14-15 pounds heavier than members of the other groups and rated considerably higher on strength tests, showing a health status far superior to members of other groups.

4. The socio-economic status of the Physical Education Group was the lowest of the three groups considered, with fewer students adequately financed for their college careers.

5. Parental education of the Physical Education Group was also inferior to the averages in the other two groups, with the occupational status of fathers of students in the Physical Education Group and Education Group being fairly similar, with about twice as many fathers of students in the General Education Group in the professional or executive brackets.

6. In personality, members of the Physical Education Group ranked highest in emotional stability and dominance and slightly lower in self-sufficiency. In leadership, as indicated by extra-curricular activities, the Physical Education Group excelled by a wide margin.

7. Physical Education students revealed the possession of interests peculiar to their field.

The author concludes his report with a number of recommendations relative to entrance requirements in schools of physical education and pre-training selection of teachers. The connection between these recommendations and the study is rather remote, we believe. Conclusions derived from the comparison of relatively small groups selected at random are of little significance: typical sampling should have given more trustworthy results.

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COLE, PERCIVAL R., Editor. *The Rural School in Australia* (Melbourne: Melbourne University Press, 1937), 244 pp. 10/—.

The aim of rural education in Australia, according to the authors of this book, is not to make farmers, but to make citizens; it is not alone to keep people contended if they do stay on the land, but to improve the conditions of rural life; and—most important of all—the highest aim is "to develop the rural child as a person." (p. 67). These aims have been kept in mind consistently by the various contributors,—men who undoubtedly understand the rural situation in Australia, and, incidentally, that of America also. For one of the most interesting conclusions drawn from a study of this volume, is the fact that the problems of rural education in Australia are almost identical with our own problems in that field.

These Australian educators have developed a sound philosophy of rural education and have presented it in a challenging manner to all who understand the importance of the rural situation and its needs. The basic assumptions of this philosophy may be summarized briefly.

1. Although there are many imperfections in the present rural situation, it is fundamentally an important issue for all educators and laymen. Approximately 50 percent of Australian children of school age attend rural institutions, and this condition is likely to exist for some time.

2. The *child* and his *personal development* must be considered first and foremost at all times. The curriculum, the administration, the physical plant, must be planned *for* him and be consistent with his needs and interests.

3. Next to the pupil, the teacher is the most important element in rural education. One of the vital problems in all Australian Education Departments is that of supplying capable, enthusiastic teachers for rural schools.

4. The rural schools must and should be organized on a different basis than that of urban schools; but this in no wise means that the rural school need be inferior in any way. In fact, given the right teacher and the right curriculum, more advantages, in some respects, are possible in the rural than in the urban situation.

5. Rural education must be highly individualized, starting with the "child's experiences, and still striving to provide him what he lacks; namely, extended experience and social opportunity." (p. 68).

In line with this philosophy, the first chapters deal with a discussion of the Australian environment and the psychology of the rural child. The latter may well be studied by all teachers of rural schools, as may also those sections dealing with courses and methods of study. Here one finds so much material pertinent to our own needs that it forms a common bond between far-away Australia and the States. For instance, in recent years, rural educators in America have been concerned with grouping pupils for needs, or on the basis of abilities, rather than combining more or less artificial "grades." The Australian problems are similar, as certified by this quotation:

"The grade level of proficiency, in the case of any child is an average of his separate subject proficiencies, weighted, perhaps, in favor of certain subjects. It is consequently not at all unusual for a child to be above grade level in one subject and below it in another. The extent to which members of any grade possess degrees of proficiency lying outside the grade standards, either above or below, is technically called overlap. Overlapping of proficiency is quite normally found when suitable tests are applied, even if, as in most of the Australian States, the main basis of classification is scholastic performance.

"The significance of this overlap seems largely to have been overlooked by our curriculum makers, particularly in the rigidity of grade prescriptions." (pp. 130, 131).

The administration of rural schools is highly centralized in some respects. In their analysis and criticism, the authors have pointed out both the advantages and disadvantages of this organization. School buildings and teachers are apt to be uniformally better, as finances are divided and appointments made at the central office of the Educational Department of each Australian State. Standards of rural schools compare favorably with those in cities: the school year of 210 days is the same; equipment is provided in like proportions; and organization, curricular helps and supervision are given the same consideration in one as the other. The defects are, of course, inherent in the tendency toward uniform and too rigid courses of study, but the contributing educators, being aware of this fact, have shown the way to overcome the handicaps. In fact, it is pointed out that a study of rural school time-tables (programs), reveals many individual differences, and as one author states, belies the criticism that Australian rural schools are "monotonously alike." (p. 172).

The uniqueness, from our point of view, of the education described in this book, comprises such minor features as these:

The majority of the rural schools seem to contain six grades of so-called primary work, instead of our usual eight-grade organization. When the 7th and 8th grades are included they are called, in some states, "supplementary grades."

Although the school year is longer (210 days), the school day is usually shorter school being in session from 9:15 A.M. or 9:30 A.M. to 3:30 P.M.

Separate classes are often scheduled on the time-tables for Poetry, Dictation, etc. instead of including these in what we call a Language or English period.

But the contributions made by Australian rural educators are much more significant than the unique features. Two of the most important contributions are the rural science courses in upper grade work, and the Young Farmers' organizations. The methods used in incorporating these activities into the usual school work are worthy of study; for in this respect, Australian rural education has progressed more than our own in utilizing the rural environment as a basis for developing the individual child.

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EFRON, ALEXANDER. *The Teaching of Physical Sciences in the Secondary Schools of the United States, France, and Soviet Russia.* Contributions to Education, No. 725 (New York: Bureau of Publications, Teachers College, Columbia University, 1937), pp. vii + 296. $2.35.

The purpose of the study was: (1) to discover the salient characteristics of the teaching of physical sciences in the secondary schools of the United States, France and Soviet Russia; (2) to evaluate and compare the types of teaching procedures; and (3) to determine possible implications of foreign practice for physical science teaching in the United States.

The author spent seven months in France and Russia in 1935, and speaks and understands both French and Russian. His knowledge of the American science program is based upon fifteen years of teaching experience in New York City schools.

The study is characterized by the author as being descriptively analytical, because of lack of data that could be treated with statistical validity. The educational philosophies and the educational standards of the three countries studied were so radically different from each other that the final comparison was made

by viewing foreign procedures against the background of American education.

The author gives a brief history of American education, as well as a more complete historical treatment of French and Russian education, which gives the reader the necessary background for an understanding of present educational practices in these countries.

The national system of education of each of the three countries was analyzed. Senior high schools in the United States, second level schools of France, and the six year secondary schools of the Soviet Union were selected for science teaching comparison.

The content and organization of courses of study, training of science teachers, nature of examinations and textbooks, methodology, extra-curricular science work, and type of use of science equipment were analyzed and compared. The American methods are described first under the headings given above, followed by a discussion of the methods of the French and Russian under the same headings. The discussions are of necessity brief, and not at all inclusive, but they give one a broad view of each of the different aspects of science teaching under comparison.

Personal observations made by the author of actual classroom science instruction in both France and Russia, help to give the reader a clearer concept of the methods in operation in these countries.

An interpretative summary following the more lengthly descriptions of the methods, content, textbooks, tests, apparatus, and extra-curricular work, serves to make clear the outstanding likenesses and variations of methods in operation in the three countries. The weaknesses as well as the strong points as seen by the author are recorded. This section summarizes quite well, the important points of the preceding chapters.

The conclusions and implications reached as a result of this study are limited to four pages. These are, however, worthy of consideration by American science teachers. A few of these conclusions are quoted in this review in the hope that they may stimulate the reader to read the book itself for the evidence upon which these conclusions are based.

1. American science teaching is confused in both scope and ultimate purpose.

2. There is no agreement among American science teachers as to what is really important in the science course of study, or whether facts, theories, habits, skills, or certain character concomitants ought to be stressed.

3. Unlike the European secondary school, the American high school lacks perspective, is unhampered by external standards, and exhibits no clear-cut educational philosophy.

4. The differentiation of schools, as opposed to the differentiation within the framework of a single school, may prove the means of rendering American science teaching a more significent and functional instrument.

5. American methods of teaching science on the secondary school level are, on the whole, more original, varied, and skilful than those in vogue in the other two countries under investigation.

6. The science pupil of the Soviet Union participates in a science program that derives its significance from the totality of his everyday experiences.

It is unusual indeed to find an author who, through his knowledge of the languages of other countries, can make a study of this nature, and the reviewer feels that American science teachers interested in curriculum revision will find this book well worth reading.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

ABBOTT, ROBERT B. *Class Size—Spring Term, 1937-38, Junior High Schools* (Oakland, California: Oakland Public Schools, Research Division, April, 1938), 9 pp. Mimeographed.

This report of junior high school class size presents an analysis of class size by school and by department for the current year based upon information secured from teachers' program cards, and offers a comparison with data from three previous years.

ABBOTT, RICHARD B. *Class Size—Spring Term, 1937-38, Senior High Schools* (Oakland, California: Oakland Public Schools, Research Division, May, 1938), 9 pp. Mimeographed.

The various sections of the report present an analysis of class size by school and by department of instruction as found by a study of teachers' program cards.

ABBOTT, RICHARD B. *Class Size—Spring Semester, 1937-38, Elementary Schools* (Oakland, California: Oakland Public Schools, Research Division, June, 1938), 11 pp. Mimeographed.

An analysis of data based upon enrollment reports show the median size elementary class is 36.5, with a range from 24 to 41.

ABBOTT, ROBERT B. *Report on Professional Study of Teachers and Principals of the Oakland Public Schools* (Oakland, California: Oakland Public Schools, Research Division, June 17, 1938), 6 pp. Mimeographed.

This bulletin presents a statistical summary of teachers and prinicpals who, during the year ending December 31, 1937, did some professional study.

CHARTERS, W. W. (Editor) *Educational Research Bulletin, Ohio State University* (Columbus: College of Education, Ohio State University, September, 21, 1938), 27 pp.

This issue of the Bulletin is devoted to a description of the 1938-39 program of research and service of the Bureau of Educational Research of Ohio State University and contains discussions of Accomplishment Tests, Appointments, Curriculums, Editorial, High-School and College Relations, Personnel, Radio.

DAVIS, MARY DABNEY. *Preparation for Elementary School Supervision,* Bulletin 1937, No. 18, Office of Education, United States Department of the Interior (Washington: United States Government Printing Office, 1938), 76 pp.

This bulletin presents a survey, based upon catalogs and similar publications, of the course offerings in 786 institutions concerned with preparation for elementary school supervision.

FOWLKES, JOHN GUY, and BEERY, GEORGE S. *A Study of the Transportation of*

High School Pupils in Wisconsin, 1937-38, Curriculum Bulletin of The Department of Public Instruction, State of Wisconsin (Madison: Department of Public Instruction, September, 1938), 84 pp.

The authors analyze information based upon 570 questionnaires relating to the need, the legal bases, the policies and practices of transporting high-school pupils in Wisconsin; and propose a definite code for the transportation of high-school pupils.

GRAY, RUTH A. *Doctors' Theses in Education*, Pamphlet No. 60, Office of Education, United States Department of the Interior (Washington: United States Government Printing Office, 1935), 69 pp.

This bulletin gives a list of 797 dissertations deposited with the Office of Education and available for loan.

HARLAND, BLANCHE A., and PAUL, J. B. *Relation of Placement Test Scores to Mortality and Scholastic Ratings; Five Year Summary*, Research Report of the Iowa State Teachers College, No. 51 (Cedar Falls: Iowa State Teachers College, July 15, 1938), 36 pp. Mimeographed.

The authors attempt to determine the extent to which placement test scores predict the later scholastic achievement of entering freshmen and find, on the basis of a five year study that the placement tests predict scholastic achievement with considerable accuracy. The authors see a need for selective admission to teacher training.

JOHNSON, PALMER O., and HARVEY, OSWALD L. *The National Youth Administration* (Washington: United States Government Printing Office, 1938), 121 pp.

This bulletin presents a study of the work of the National Youth Administration, a description of its organization and programs, and some evaluation of its accomplishments based upon statistical reports, field trips, interviews and questionnaires.

KEYS, NOEL, *The Underage Student in High School and College; Educational and Social Adjustments*, University of California Publication in Education, VII, No. 3 (Berkeley: University of California Press, 1938), 124 pp.

The author presents data regarding the scholastic achievement, physical condition, personality adjustments and the social adjustments of 348 college and 113 high school students who were underage, that seem to indicate that acceleration up to two years at least makes for better adjustments, social as well as intellectual.

LAFFERTY, H. M. *Graduate Studies: Abstracts, 1937-38*. Bulletin of the East Texas State Teachers College, XXI, No. 5 (Commerce, Texas: East Texas State Teachers College, September, 1938), 28 pp.

This bulletin has for its purpose the description of graduate research work now being carried on in twenty institutions of higher learning in the state of Texas and gives abstracts of theses for the year 1937-38.

LEARY, BERNICE E. *Curriculum Laboratories and Divisions: Their Organization and Functions in State Departments of Education, City School Systems, and Institutions of Higher Learning*, Office of Education, United States Department of the Interior, Bulletin No. 7 (Washington: United States Government Printing Office, 1938), 33 pp.

This report aims to indicate current trends in the handling of administrative problems associated with curriculum improvement and presents the findings obtained from an inquiry addressed to 23 state departments of education, 35 institutions of higher learning, and 503 city school systems.

LINZ, C. C. *The Establishment of a National System of Education in New South Wales*, Bulletin of the Australian Council for Educational Research, No. 51 (Melbourne: Melbourne University Press, 1938), 84 pp.

The author discusses the factors involved in the initiation and growth of the State system of Education in New South Wales.

MELBO, IRVING R. *Results of Low-Fourth Grade Mental and Reading Tests, Spring Semester, 1938* (Oakland, California: Oakland Public Schools, Research Division, April, 1938), 14 pp. Mimeographed.

This bulletin gives an analysis of scores on the New Stanford Reading Test, Form X, and the Kuhlmann Anderson Intelligence Test for Grade IV for 1163 children in the Oakland public schools.

MELBO, IRVING R. *Results of High Ninth Grade Mental and Reading Tests, Spring Semester, 1938* (Oakland, California: Oakland Public Schools, Research Division, May, 1938), 18 pp. Mimeographed.

Data gathered on 2441 pupils in administering the Terman Group Test of Mental Ability, Form A and the New Stanford Reading Test, Form X tend to show a marked homogeneity in chronolgical age, but great variability in mental and reading ages.

MELBO, IRVING R. *Results of Low Second Grade Mental Tests, Spring Semester, 1938* (Oakland, California: Oakland Public Schools, Research Division, May, 1938), 6 pp. Mimeographed.

The author found that the distributions for both chronological and mental age for low second grade pupils in Oakland public schools were typical of the normal distribution curve.

MELBO, IRVING R. *Results of High-Sixth Grade Mental and Reading Tests, Spring Semester, 1938* (Oakland, California: Oakland Public Schools, Research Division, June, 1938), 13 pp. Mimeographed.

Data from 2062 cases seem to indicate a marked homogeneity in the chronological ages of high-sixth grade children in the Oakland public school system.

PETERS, CHARLES C. *Abstracts of Studies in Education at the Pennsylvania State College*, Pennsylvania State College Studies in Education, No. 21 (State College: School of Education, Pennsylvania State College, 1938), 52 pp.

This bulletin is devoted to abstracts of studies in education at the Pennsylvania State College.

REMMERS, H. H. (Editor) *Further Studies in Attitudes, Series III*. Purdue University, The Division of Educational Reference, Studies in Higher Education, XXXIV (Lafayette: Division of Educational Reference, Purdue University, September, 1938), 151 pp.

This monograph adds eleven further studies to those previously published in this field and aims to supply further scientific evidence concerning the theoretical and practical problems and implications of attitude measurements with particular stress on the secondary school level.

SEAY, MAURICE F. *Adult Education: A Part of a Total Educational Program, A Description of the Educational and*

Training Program of the Tennessee Valley Authority, Bulletin of the Bureau of School Service, College of Education, University of Kentucky, Vol X, No. 4 (Lexington: University of Kentucky, June, 1938), 194 pp.

This bulletin discusses the development of an educational program for employees and their children of the Tennessee Valley Authority from the standpoints of principles of an educational program; administration; supervision, and coördination; training opportunities for the professional staff; apprentice and job training for craft workers; library service; recreation service; negro training; and general adult education.

SEGEL, DAVID. *Nature and Use of the Cumulative Record*, Office of Education, United States Department of Interior, Bulletin No. 3 (Washington: United States Government Printing Office, 1938), 48 pp.

The author discusses the place, current practices, suggestive procedures, and prognostic values of cumulative records.

SMITH, HENRY LESTER (Director) and OTHERS. *Twenty-Fifth Annual Conference on Educational Measurements*, Bulletin of the School of Education, Indiana University, Vol. XIV, No. 4 (Bloomington: Bureau of Coöperative Research, Indiana University School of Education, September, 1938), 37 pp.

This bulletin reports five speeches which were given at the Twenty-fifth Annual Conference on Educational Measurements held at Indiana University, April 13, 1938.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

LACEY, JOY M., and OTHERS. "Discrepancies Between Teacher Education and Classroom Teacher Needs," *The Teachers College Journal*, IX (May, 1938), pp. 160-163, 168.

The author made a survey to determine the teaching-learning activities considered most important by classroom teachers, specialists in education, and authors of textbooks on elementary school organization and concludes that the activities in which there might be more adequate training are: (1) in the field of social behavior habits leading to the development of a desirable personality and (2) in the field of the language arts which includes reading.

PULLIAM, ROSCOE. "What Sort of Person Should a Beginning Teacher Be?" *The Elementary School Journal*, XXXVIII (June, 1938), pp. 747-750.

The author presents several questions to be asked about a prospective teacher which deal with matters of general education; with the fundamental facts about the world in which we live; and with the basic skills, habits, and attitudes that are necessary for intelligent citizenship and satisfactory adjustment in society.

CURRICULUM CONSTRUCTION

HARAP, HENRY. "Seventy-One Courses in Consumption," *The School Review*, XLVI (October, 1938), pp. 577-596.

On the basis of an analysis of 71 course outlines the author finds that, in general, courses in consumption are dominated by one textbook, and few imply a basic treatment of the role of the consumer in a democratic society.

POND, FREDERICK L. "Influence of the Study of Latin on Word Knowledge," *The School Review*, XLVI (October, 1938), pp. 611-618.

Data gathered by the author seem to indicate a positive biserial correlation be-

tween the vocabulary scores of members of the random group of 208 pupils and the fact that they had studied Latin, and also that the group which had had experience with the study of Latin was superior in intelligence to the group which had not studied the language.

RUDISILL, MABEL. "Selection of Pre-Primers and Primers—A Vocabulary Analysis II," *The Elementary School Journal*, XXXVIII (June, 1938), pp. 767-775.

From the analysis of vocabularies of preprimers and primers, the author concludes that the sequence in which these books are read is an important factor in determining a child's progress in beginning reading.

TYLER, I. KEITH. "What Can We Do About the Radio?" *The English Journal*, XXVII (September, 1938), pp. 556-566.

The author presents the thesis that only by a positive program of radio education will we be able to preserve as well as make more effective democracy in American life.

PUPIL GUIDANCE, WELFARE AND DEVELOPMENT

SANDON, FRANK. "The Comparative Effect on School Progress of (a) Many Short and (b) One Long Absence in a Secondary School," *The British Journal of Educational Psychology*, VIII (June, 1938), pp. 172-177.

The author examined the absences of 150 boys in a mixed secondary school throughout an academic year in relation to their academic standing in the term following their absence and concludes that frequent short spells of absence are related with educational retardation more than are less frequent longer spells of much greater total duration.

TRAXLER, ARTHUR E. "Case-Study Procedures in Guidance," *The School Review*, XLVI (October, 1938), pp. 602-610.

The author presents suggestions for assembling and organizing data in a case study, outlines for case studies, and points to be observed in making a case study, emphasizing the fact that each case study must be evaluated according to the contribution that it makes to the better adjustment of the pupil.

RESEARCH NEWS and COMMUNICATIONS

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Educational Policies Commission. — Three fundamental interpretations of the relationship which public education bears to our national life mark the recent progress of the Educational Policies Commission. Created in November, 1935, to define guiding policies for American education, the Commission published its first pronouncement, *The Unique Function of Education in American Democracy*, a little more than a year later. Since then it has elaborated the concepts in this initial document into two further statements entitled *The Purposes of Education in American Democracy* and *The Structure and Administration of Education in American Democracy*. These last two contributions are here briefly described:

The Structure and Administration of Education in American Democracy, published in June, 1938, sets forth trends with regard to the structure and scope of the common school system and clarifies principles of administration which govern the interrelationships of local, state, and federal educational establishments. The document notes that the traditional school organization is being modified to include the nursery school, kindergarten, and first six years of the common school program as a first unit; a four-year program of continued general education as a second unit; and a final four-year program in which some differentiation according to vocational and other interests is begun.

Sound educational policy requires that state educational authorities establish a minimum common school program and encourage communities to exceed this minimum. This can be done only through providing financial support and establishing adequate units for attendance and administration. Proper control of educational policy can be exercised only where fiscal and administrative independence from the general municipal authority is enjoyed.

The growing economic and socio-cultural unity of this nation calls for increasing participation of the federal government in the financial support of public education. Such support should tend to equalize educational opportunity without involving control by the federal government.

Maintenance of the doctrine of separation of church and state is considered to be of surpassing importance in the determination of educational policy by local, state, and federal governments.

The Purposes of Education in American Democracy, published in September, 1938, points out that the chosen social policy of this nation is democracy and that the educative process must be of such a nature as to promote the general welfare, civil liberties, government by consent of the governed, the appeal to reason, and the pursuit of happiness. Preservation and promotion of these cherished doctrines require:

Education for self-realization, involving command of basic intellectual and physical skills, knowledge and practice of healthful living, ability to play, love of

beauty, and the capacity to give direction and character to one's own life;

Education in human relationships through the promotion of pleasant and useful associations with friends and neighbors and a satisfying home and family life;

Education for economic efficiency through preparation of competent producers and consumers who can constructively apply a clear understanding of economic forces to their own immediate problems; and

Education for civic responsibility by making individuals socially, economically, and politically literate and intelligently active in the defense and improvement of American democracy.

Plans for the coming year call for completion of two pronouncements. *The Economic Basis of Education,* which will be comparable in importance with the first three mentioned, makes clear the tremendous potential economic consequences of effectively free public education. *Social Services and the Schools* defines the sphere of educational service and sets forth policies for coöperation with related services which lie outside the field of education.

With the first half of its five-year existence completed and with several basic policies for American education giving direction to its thinking, the Commission will henceforth devote a larger share of its energies to implementation of policies. Forthcoming pronouncements will elaborate particular aspects of the basic recommendations produced during earlier years.

The conference program is being expanded to include regional institutes on Educational Policy which will provide Consultants and Commission members with opportunity for discussing together the creation and application of new policies. Through such means as these the Educational Policies Commission will seek to influence the profession and the public to consider and adopt the policies recommended.

W. G. Carr, secretary of the Commission, is the author of this progress report.

Research Division, N. E. A. — During 1938-39 the Research Division will continue its program in these areas: letters of inquiry, legislation, committee reports, yearbooks, research bulletins, Educational Research Service, and special problems.

Letters of inquiry. — The information service of the Research Division is coördinated with the Educational Research Service (operated jointly with the American Association of School Administrators). During the year the Division will answer several thousand letters of inquiry from pupils, educators, and laymen. This work requires the preparation of hundreds of bibliographies and the distribution of many publications.

Legislation. — In coöperation with the Legislative Commission, the Division distributes informational aid to those interested in state legislation. There is an active demand for analyses of retirement, tenure, and various other types of personnel legislation. The Division also supplies data for the Association's program of federal aid legislation.

Committee reports. — The Association has a number of active committees at work. The Committee on the Economic Status of the Rural Teacher expects to issue its final report in January, 1939. This study of the income and expenditures of rural teachers is under the immediate direction of Richard R. Foster, assistant director. Reports on salary problems (for the Committee on Equal Opportunity and the Committee on Salaries) are proceeding under the immediate direction of Hazel Davis, assistant director. A survey of lay and professional opinion on the subject of teacher freedom is being made

for the Committee on Academic Freedom. Also, under the immediate supervision of the associate director, F. W. Hubbard, are several studies for the Committee on Tenure, the Committee on Credit Unions, and the Committee on Supply, Preparation, and Certification of Teachers. Most of the foregoing reports will be available for the summer convention in 1939.

Yearbooks. — The Division is assisting in the preparation of a yearbook on the application of research to classroom problems. This yearbook is sponsored jointly by the American Educational Research Association and the Department of Classroom Teachers. Dr. Foster is serving as consultant on the 1939 Yearbook of the Department of Elementary School Principals which deals with enriching the curriculum for the elementary-school child. In February, 1939, the American Association of School Administrators, with the consultative aid of the associate director, will issue a handbook for superintendents in small school systems. Considerable progress will be made also on the superintendents' yearbook for 1940, treating the subject of safety education.

Research bulletins.—The issues of the *Research Bulletin* during 1938-39 are given over to the topics: statutory status of six professions (September), safety teaching (November), status of rural teachers (January), salaries in 1938-39 (March), and teachers load (May). The March, 1939, bulletin will summarize the Division's survey of salaries in seventeen hundred city school systems. The teacher load study is being planned to include not only objective data, but also the judicious opinions of classroom teachers with regard to their assignments. This work is under the immediate supervision of Charles R. Tupper, assistant director on exchange.

Educational Research Service. — This subscription service, operated jointly with the American Association of School Administrators, supplies data to nearly 450 school systems and colleges. In addition to individual letters to subscribers, circulars on the following topics are included in the year's program: education in lay magazines, promotion policies in city school systems, and aspects of school library administration.

Special problems.—Through funds supplied by the Highway Education Board, the Division is preparing materials in the field of safety education. Data supplied by nearly fifteen thousand classroom teachers will be published in the November *Research Bulletin*. Other materials will be used in connection with the 1940 Yearbook of the A. A. S. A. Lists of sources of safety aids, analyses of courses of study, and other materials also are being prepared for distribution during the school year.

This statement was prepared by F. W. Hubbard, associate director of the Research Division.

Comparative Education. — The International Institute of Teachers College, Columbia University, has in the press the *Educational Yearbook, 1938*, which will appear before the close of the year and will be devoted to a discussion of "Problems of Rural Education" in different parts of the world. The *Educational Yearbook, 1939*, will be devoted to a discussion of "The Meaning of Liberal Education in the Twentieth Century."

The Australian Council for Educational Research and the New Zealand Council for Educational Research have published jointly a report by I. L. Kandel on his study of education in the two Commonwealths under the title, *Types of Administration*.

A Conference of the International Examinations Enquiry was held under the

auspices of the Carnegie Corporation of New York and the International Institute of Teachers College, Columbia University, in Dinard, France, September 16-19; it was attended by representatives from England, Finland, France, Norway, Scotland, Sweden, and the United States. The report of the Conference proceedings will be published early in 1939.

Alabama Studies.—Since the inauguration of school survey services in the Alabama State Department of Education, 61 surveys and several partial surveys have been completed and reports made to local boards of education. Six county surveys are scheduled for 1938-39. The survey of Montgomery County is to include the county and city.

One of the most recent developments undertaken in the survey work is in the field of pupil transportation. A complete transportation program has been developed for Elmore County, which gives the location of the school bus route, the bus stops, the bus load, the time required for each pupil to reach the school from his bus stop at the average rate of speed maintained by the drivers last year for prevailing road conditions, and the bus stops per mile.

For the year 1938-39 a survey will be made of Elmore County on the instructional program and the economic and social conditions in the county as they affect the school program. Final forms are not yet complete for this survey.

The school survey work is directed by the State Department of Education and is accomplished through the coöperation of the institutions of higher learning which furnish field staff workers. Through this coöperation able consultants who may have different points of view are secured in working out well balanced survey programs.

The Department has completed the development of uniform financial accounting forms for public transportation whereby complete cost accounting can be secured according to bus load, number of pupil stops per mile, road conditions, and the type and condition of the motor vehicle used. In addition, uniform school bus inspection forms and accident reporting forms have been provided for all school systems transporting pupils at public expense. These forms, in addition to being of potential help in further safeguarding pupil transportation, will furnish accurate cost accounting whereby the relative merits of public and private ownership of school busses may be determined and comparable figures obtained for comparison between counties.

Research is in progress on the development of safety standards and regulations for school bus operation, and the plan is to have the report of these standards ready by 1939.

Plans are underway for showing the trends in the different phases of educational development in Alabama.

The majority of the counties in the state are engaged in programs of curriculum development to meet the needs of the local schools. Several counties are in the third year of this study, and four bulletins on the curriculum work have been printed, while two are in the process of being published.

A. R. Meadows is supervisor of research and surveys.

Georgia Studies.—During the year 1937-38 the state of Georgia has completely revised its system of certification. This revision calls for the raising of requirements for teachers. Among these new standards is the elimination of temporary certificates, or certificates issued without a minimum of nine semester hours in education. Bachelor's degrees

are now required as a minimum for high school certificates, and two years of college work as a minimum for elementary certificates.

There has been appointed a state-wide advisory committee composed of public school men and representatives of teacher training institutions for the purpose of working out a state-wide program for the training of teachers. Through this committee steps have already been taken toward the elimination of the two-year normal course and the substitution of a minimum four year training program for the purpose of training teachers for both elementary and high school work.

Public school funds in the state are now being paid to teachers on the basis of certificates held. Low salaries are paid to those with low type certificates. This has encouraged the employment of well trained teachers and the dismissal of poorly trained teachers in the public schools of the state of Georgia.

Five years ago there was begun in the state of Georgia a coöperative study on the part of the public school teachers, college instructors, and State Department of Education representatives. This study was aimed at a program for the improvement of instruction, or curriculum revision. The director of this program is the State Director of Teacher Education and Certification in the State Department of Education, M. E. Thompson. Serving as adviser is a representative of the University System of the State of Georgia. More than twelve thousand teachers have had a part in this study. Hundreds of teachers have served on official committees for the purpose of compiling and publishing bulletins designed for a new program of education in the state.

There will be no attempt to publish a state course of study; instead it has been determined to issue from time to time bulletins on various phases of curriculum development. During the year 1937-38 fourteen bulletins have been published for this purpose. These bulletins are designed primarily to deal with actual living problems as they exist in the state of Georgia. They are intended to supplement text books which are being furnished free by the State Board of Education. These bulletins are furnished to all of the teachers of the state.

The curriculum revision program is also being carried on in connection with the state-wide advisory committee on teacher education. It is believed in the state of Georgia that the program of curriculum development is largely a problem of teacher education. The immediate task in the state is to work in that direction.

Virginia Projects. — The Division of Research in the Virginia State Department of Education was organized in 1927. For three years the program was dominated by local surveys which in reality constituted a consultation service to local school boards and superintendents.

The need for better solutions for problems and the dissatisfaction with many accepted standards caused this survey consultation service to be superseded by a series of experimental demonstrations and comprehensive studies of major problems. For four years these more truly research activities dominated the work of the Research Division. The proved effectiveness and efficiency of: certain adjustments in teacher-load, reorganization of high schools, changes in the content and organization of the curriculum, together with new information assembled in the studies of the effect of the density of school population upon school organization and costs and the five year study of the Effect of Educational Practices Upon Pupil Learning, all called for recognition in a new State Educational Program.

With the program formulated, and justified by data, another change in the division's work came about and for the past three years the Research Division has confined its efforts largely to preparing the data necessary for the administration of the State program and revising the report forms for collecting official data. Whether the Research Division in the Virginia State Department of Education will shortly begin a new cycle of activities which will call for a period devoted to studies and experimentation, or whether it has found its place and will continue indefinitely as a service agency to supply such data as are readily available to solve the day by day administration problems of the Department remains to be seen.

Research has been a very popular word and it has been applied loosely to many necessary activities, but research which creates new knowledge and which does not support the status quo or the dominant ideas of the times is likely to find optimum conditions for its work in graduate schools rather than in legally organized State Departments of Education whose primary function is to administer existing statutes. Now and then important research projects may be carried through under the official direction of a State Department, but this tie-up is not likely to favor an adequate, consistent, and free attack upon educational problems in general. Departments of Education can effectively encourage pure research, but most likely they themselves will produce research findings for immediate use within the organization rather than for publication.

This statement was prepared by C. E. Myers, supervisor of research in the Virginia State Department of Education.

Research in West Virginia.—The Division of Research has recently completed studies of pupil load, elementary school promotion, and school survival rates in the schools of West Virginia.

The study of pupil load shows that the elementary schools of the state seem to have attained their maximum growth. Recent annual changes in junior high school enrollments are not statistically significant. The senior high schools are being affected by the most important changes in attendance and enrollment. During 1930-36 high school enrollments averaged an increase of 7,066 per year.

The elementary pupil-teacher ratios ranged from 16.9 in Doddridge County to 32 in Hancock County, while the high school ratios ranged from 17.6 in Wyoming County to 27.8 in Logan. The state averages were 23.6 for elementary schools, and 25.5 for high schools. In the counties the size of the pupil-teacher ratios was definitely correlated with the percentages of pupils attending in schools with more than one teacher. Light pupil-teacher loads occurred in rural sparsely settled counties. High school ratios tended more toward uniformity than those in the elementary schools.

The study of elementary promotional school rates shows: (1) too much nonpromotion in the first and eighth grades; (2) failures are found more often among boys than girls; (3) significant improvement in the eighth grade promotional rate during recent years; (4) no racial differences in promotional rates.

The investigation of school survival rates follows the retention of fifth-grade pupils through high school and college graduation, ten different classes being considered. The worst break in the state school system is in the ninth grade, about 10,000 eighth-grade enrollees quitting school annually. Of 1,000 pupils in the fifth grade in 1926, 851 survived to the sixth grade; 719 to the seventh grade; 682 to the eighth grade; 455 to the ninth; 354 to the tenth; 318 to the

eleventh; 293 to the twelfth; and 247 to high school graduation in the classes of 1937.

State comparisons were made with comparable national survival rates compiled by the United States Office of Education. In the retention of its pupils the school system of West Virginia lags considerably behind the national trend.

Richard E. Hyde is director of research.

St. Louis Projects.—The Division of Tests and Measurements in the St. Louis Public Schools is pursuing a number of research studies with the aid of clerks employed by the Federal Government through the Works Progress Administration and the National Youth Administration. These studies include:

1. A continuing survey of the progress and failure of high school pupils, based on teachers' marks and on the use of standardized tests.

2. A study of maladjusted high school pupils who have high I.Q.'s, based on data derived from a series of tests and questionnaires administered to such pupils and to an equal number of highly successful pupils paired with them as to age and I.Q.

3. Ways of adapting school work to the needs of superior and specially talented pupils in classes not organized by homogeneous grouping, based on case descriptions supplied by the teachers.

4. Progress in the use of sentences by children in the elementary schools, based on their free compositions submitted without revision.

5. A survey of school achievement in the elementary grades in comparison with similar findings in previous surveys, based on the use of standardized tests.

6. Knowledge of pupils concerning the provisions in the United States Constitution, based on a standardized test.

With the exception of the last study named in the list, the investigations are still in progress. The findings in the study relating to knowledge concerning provisions in the United States Constitution have been reported to the Superintendent of Instruction, and announced to the community through local newspapers. In brief, this study showed that children above the seventh grade in St. Louis have more knowledge of constitutional provisions at present than they had in 1927, on the basis of the same test. The increase appeared in all grades and with respect to nearly all questions. The greatest improvement was shown in response to the question "Does any Amendment guarantee the freedom of speech, or of the press?" (Yes). The only questions where a decrease occurred related to prohibition and to certain powers of Congress and the electorate, particularly: "Who has the power to regulate commerce among the several states?" (Congress); "Whose duty is it to fix the standard of weights and measures?" (Congress); "Who has the right to choose senators from each state?" (People). Since little change has occurred in the course of study since 1927, it is believed that current interest in the interpretation of the Constitution in relation to governmental policies has had the effect of producing in general a better knowledge of its contents. The other studies which are still in progress by the Division of Tests and Measurements, of which George R. Johnson is director, will be reported later to the Superintendent of Instruction, either in published or unpublished form.

Yale Clinic of Child Development.—The normative researches reported in previous volumes *(Infant Behavior: Its Genesis and Growth* and *The Psychology of Early Growth Including a Method of*

Genetic Analysis of Early Behavior by Gesell and Thompson, assisted by Amatruda) are being continued by means of follow-up studies of the original group of normative infants now 8, 9 and 10 years of age. Records of behavior examinations, of interviews and home visits, of postural activity, free play, prehension and manipulation, and of physical measurements, combined with cinema records, provide consecutive materials for studies of individuality and developmental sequence.

Gesell, Amatruda, Castner, and Thompson have collaborated in the publication, *Biographies of Child Development:* The Mental Growth Careers of Eighty-four Infants and Children. This book of cases will be presently published by Harper and Brothers, and deals with a wide diversity of children presenting many different varieties of behavior development, culled from the case records of some 10,000 children seen in the Clinic, including follow-up studies of thirty cases (reported ten years ago in *Infancy and Human Growth*). The diagnoses made in infancy and later diagnosis are brought into comparison. Special sections deal with birth injuries, physical asymmetries, glandular and nutritional factors, immaturity and prematurity, twinship, physical complications, language and reading disabilities, and with foster care and child adoption.

Henry M. Halverson is continuing his researches in borderline areas of genetic psychology and of neurophysiology of infants. He has in press a detailed monograph on *Infant Sucking and Tensional Behavior.* Apparatus has been devised to measure muscular movements and to record rhythm, amplitude, and configuration of the infant pulse through the frontal fontanelle. Simultaneous records are being secured of costal respiration, abdominal respiration, hand tension, leg movements, and pulse.

Frances Ilg is making observations and records of expressional behavior, of posture and motor demeanors in connection with behavior problems referred to the Nursery.

Helen Thompson has just published an article entitled, "Body Proportions in the Growing Infant," and is continuing her biogenetic studies of children observed in early infancy.

Arnold Gesell is publishing a study entitled, "The Tonic Neck Reflex in the Human Infant: Its Morphogenetic and Clinical Significance" (current number of the *Journal of Pediatrics*). This reflex, formerly supposed to be a pathological phenomenon, is a normal characteristic of early infancy as well as a diagnostic indicator in cases of neurological defect and developmental retardation. In collaboration with the Departments of Surgery and of Obstetrics, he has completed a study on "Mental and Physical Growth in Pubertas Praecox." This study is based on data gathered over fifteen years of observation and deals particularly with developmental and endocrine factors (to be published in a forthcoming number of the *Archives of Neurology and Psychiatry.*) Dr. Gesell has published "Scientific Approaches to the Study of the Human Mind," *Science,* September 9, 1938.

Louise B. Ames has in press a paper entitled, "Some Relationships between Stair Climbing and Prone Progression."

The director of the clinic is Arnold Gesell.